INSTALLATION MANUAL

VRV III System air conditioner

REYQ8PY1B
REYQ10PY1B
REYQ12PY1B
REYQ14PY1B
REYQ16PY1B

Installation manual **VRVIII System air conditioner**	English
Installationsanleitung **VRVIII System Klimaanlage**	Deutsch
Manuel d’installation **Conditionneur d’air VRVIII System**	Français
Manual de instalación **Sistema de acondicionador de aire VRVIII**	Español
Manuale di installazione **Condizionatore d’aria a sistema VRVIII**	Italiano
Εγχειρίδιο εγκατάστασης **Κλιματιστικό με σύστημα VRVIII**	Ελληνικά
Installatiehandleiding **Airconditioner met VRVIII Systeem**	Nederlands
Manual de instalação **Ar condicionado VRVIII System**	Portugues
Руководство по монтажу **Кондиционер системы VRVIII**	Русский
Montaj elkitabı **VRVIII System Klima**	Türkçe

CE - DECLARATION-OF-CONFORMITY
CE - KONFORMITÄTSERKLÄRUNG
CE - DECLARATION-DE-CONFORMITE
CE - CONFORMITEITSVERKLARING
CE - DECLARACION-DE-CONFORMIDAD
CE - DICHIARAZIONE-DI-CONFORMITA
CE - ΔΗΛΩΣΗ ΣΥΜΜΟΡΦΩΣΗΣ
CE - DECLARAÇÃO-DE-CONFORMIDADE
CE - ЗАЯВЛЕНИЕ-О-СООТВЕТСТВИИ
CE - OPFYLDELSESERKLÆRING
CE - FÖRSÄKRAN-OM-ÖVERENSTÄMMELSE
CE - ERKLÆRING OM-SAMSVAR
CE - ILMOITUS-YHDENMUKAISUUDESTA
CE - PROHLÁŠENÍ-O-SHODĚ
CE - IZJAVA-O-USKLAĐENOSTI
CE - MEGFELELŐSÉGI-NYILATKOZAT
CE - DEKLARACJA-ZGODNOŚCI
CE - DECLARAŢIE-DE-CONFORMITATE
CE - IZJAVA O SKLADNOSTI
CE - VASTAVUSDEKLARATSIOON
CE - ДЕКЛАРАЦИЯ-ЗА-СЪОТВЕТСТВИЕ
CE - ATITIKTIES-DEKLARACIJA
CE - ATBILSTĪBAS-DEKLARĀCIJA
CE - VYHLÁSENIE-ZHODY
CE - UYUMLULUK-BİLDİRİSİ

DAIKIN INDUSTRIES, LTD.

01 (GB) declares under its sole responsibility that the air conditioning models to which this declaration relates:
02 (D) erklärt auf seine alleinige Verantwortung daß die Modelle der Klimageräte für die diese Erklärung bestimmt ist:
03 (F) déclare sous sa seule responsabilité que les appareils d'air conditionné visés par la présente déclaration:
04 (NL) verklaart hierbij op eigen exclusieve verantwoordelijkheid dat de airconditioning units waarop deze verklaring betrekking heeft:
05 (E) declara baja su única responsabilidad que los modelos de aire acondicionado a los cuales hace referencia la declaración:
06 (I) dichiara sotto sua responsabilità che i condizionatori modello a cui è riferita questa dichiarazione:
07 (GR) δηλώνει με αποκλειστική της ευθύνη ότι τα μοντέλα των κλιματιστικών συσκευών στα οποία αναφέρεται η παρούσα δήλωση:
08 (P) declara sob sua exclusiva responsabilidade que os modelos de ar condicionado a que esta declaração se refere:
09 (RUS) заявляет, исключительно под свою ответственность, что модели кондиционеров воздуха, к которым относится настоящее заявление:
10 (DK) erklærer under eneansvar, at klimaanlægmodellerne, som denne deklaration vedrører:
11 (S) deklarerar i egenskap av huvudansvarig, att luftkonditioneringsmodellerna som berörs av denna deklaration innebär att:
12 (N) erklærer et fullstendig ansvar for at de luftkondisjoneringsmodeller som berøres av denne deklarasjon innebærer at:
13 (FIN) ilmoittaa yksinomaan omalla vastuullaan, että tämän ilmoituksen tarkoittamat ilmastointilaitteiden mallit:
14 (CZ) prohlašuje ve své plné odpovědnosti, že modely klimatizace, k nimž se toto prohlášení vztahuje:
15 (HR) izjavljuje pod isključivo vlastitom odgovornošću da su modeli klima uređaja na koje se ova izjava odnosi:
16 (H) teljes felelőssége tudatában kijelenti, hogy a klímaberendezés modellek, melyekre e nyilatkozat vonatkozik:
17 (PL) deklaruje na własną i wyłączną odpowiedzialność, że modele klimatyzatorów, których dotyczy niniejsza deklaracja:
18 (RO) declară pe proprie răspundere că aparatele de aer condiţionat la care se referă această declaraţie:
19 (SLO) z vso odgovornostjo izjavlja, da so modeli klimatskih naprav, na katere se izjava nanaša:
20 (EST) kinnitab oma täielikul vastutusel, et käesoleva deklaratsiooni alla kuuluvad kliimaseadmete mudelid:
21 (BG) декларира на своя отговорност, че моделите климатична инсталация, за които се отнася тази декларация:
22 (LT) visiška savo atsakomybe skelbia, kad oro kondicionavimo prietaisų modeliai, kuriems yra taikoma ši deklaracija:
23 (LV) ar pilnu atbildību apliecina, ka tālāk uzskaitīto modeļu gaisa kondicionētāji, uz kuriem attiecas šī deklarācija:
24 (SK) vyhlasuje na vlastnú zodpovednosť, že tieto klimatizačné modely, na ktoré sa vzťahuje toto vyhlásenie:
25 (TR) tamamen kendi sorumluluğunda olmak üzere bu bildirinin ilgili olduğu klima modellerinin aşağıdaki gibi olduğunu beyan eder:

RXYQ5PY1(E), RXYQ8PY1(E), RXYQ10PY1(E), RXYQ12PY1(E), RXYQ14PY1(E), RXYQ16PY1(E), RXYQ18PY1(E),
RXYQ20PY1(E), RXYQ22PY1(E), RXYQ24PY1(E), RXYQ26PY1(E), RXYQ28PY1(E),
RXYQ30PY1(E), RXYQ32PY1(E), RXYQ34PY1(E), RXYQ36PY1(E), RXYQ38PY1(E),
RXYQ40PY1(E), RXYQ42PY1(E), RXYQ44PY1(E), RXYQ46PY1(E), RXYQ48PY1(E),
RXYQ50PY1(E), RXYQ52PY1(E), RXYQ54PY1(E),

REYQ8PY1, REYQ10PY1, REYQ12PY1, REYQ14PY1, REYQ16PY1,
REYQ18PY1, REYQ20PY1, REYQ22PY1, REYQ24PY1, REYQ26PY1, REYQ28PY1, REYQ30PY1, REYQ32PY1,
REYQ34PY1, REYQ36PY1, REYQ38PY1, REYQ40PY1, REYQ42PY1, REYQ44PY1, REYQ46PY1, REYQ48PY1,
REYQ8PY1B, REYQ10PY1B, REYQ12PY1B, REYQ14PY1B, REYQ16PY1B,
REMQ8PY1, REMQ10PY1, REMQ12PY1, REMQ14PY1, REMQ16PY1,
BSVQ100PV1, BSVQ160PV1, BSVQ250PV1,

01 are in conformity with the following standard(s) or other normative document(s), provided that these are used in accordance with our instructions:
02 der/den folgenden Norm(en) oder einem anderen Normdokument oder -dokumenten entspricht/entsprechen, unter der Voraussetzung, daß sie gemäß unseren Anweisungen eingesetzt werden:
03 sont conformes à la/aux norme(s) ou autre(s) document(s) normatif(s), pour autant qu'ils soient utilisés conformément à nos instructions:
04 conform de volgende norm(en) of één of meer andere bindende documenten zijn, op voorwaarde dat ze worden gebruikt overeenkomstig onze instructies:
05 están en conformidad con la(s) siguiente(s) norma(s) u otro(s) documento(s) normativo(s), siempre que sean utilizados de acuerdo con nuestras instrucciones:
06 sono conformi al(i) seguente(i) standard(s) o altro(i) documento(i) a carattere normativo, a patto che vengano usati in conformità alle nostre istruzioni:
07 είναι σύμφωνα με το(α) ακόλουθο(α) πρότυπο(α) ή άλλο έγγραφο(α) κανονισμών, υπό την προϋπόθεση ότι χρησιμοποιούνται σύμφωνα με τις οδηγίες μας:
08 estão em conformidade com a(s) seguinte(s) norma(s) ou outro(s) documento(s) normativo(s), desde que estes sejam utilizados de acordo com as nossas instruções:
09 соответствуют следующим стандартам или другим нормативным документам, при условии их использования согласно нашим инструкциям:
10 overholder følgende standard(er) eller andet/andre retningsgivende dokument(er), forudsat at disse anvendes i henhold til vore instrukser:
11 respektive utrustning är utförd i överensstämmelse med och följer följande standard(er) eller andra normgivande dokument, under förutsättning att användning sker i överensstämmelse med våra instruktioner:
12 respektive utstyr er i overensstemmelse med følgende standard(er) eller andre normgivende dokument(er), under forutssetning av at disse brukes i henhold til våre instrukser:
13 vastaavat seuraavien standardien ja muiden ohjeellisten dokumenttien vaatimuksia edellyttäen, että niitä käytetään ohjeidemme mukaisesti:
14 za předpokladu, že jsou využívány v souladu s našimi pokyny, odpovídají následujícím normám nebo normativním dokumentům:
15 u skladu sa slijedećim standardom(ima) ili drugim normativnim dokumentom(ima), uz uvjet da se oni koriste u skladu s našim uputama:
16 megfelelnek az alábbi szabvány(ok)nak vagy egyéb irányadó dokumentum(ok)nak, ha azokat előírás szerint használják:
17 spełniają wymogi następujących norm i innych dokumentów normalizacyjnych, pod warunkiem że używane są zgodnie z naszymi instrukcjami:
18 sunt în conformitate cu următorul (următoarele) standard(e) sau alt(e) document(e) normativ(e), cu condiţia ca acestea să fie utilizate în conformitate cu instrucţiunile noastre
19 skladni z naslednjimi standardi in drugimi normativi, pod pogojem, da se uporabljajo v skladu z našimi navodili:
20 on vastavuses järgmis(t)e standardi(te)ga või teiste normatiivsete dokumentidega, kui neid kasutatakse vastavalt meie juhenditele:
21 съответстват на следните стандарти или други нормативни документи, при условие, че се използват съгласно нашите инструкции:
22 atitinka žemiau nurodytus standartus ir (arba) kitus norminius dokumentus su sąlyga, kad yra naudojami pagal mūsų nurodymus:
23 tad, ja lietoti atbilstoši ražotāja norādījumiem, atbilst sekojošiem standartiem un citiem normatīviem dokumentiem:
24 sú v zhode s nasledovnou(ými) normou(ami) alebo iným(i) normatívnym(i) dokumentom(ami), za predpokladu, že sa používajú v súlade s našim návodom:
25 ürünün, talimatlarımıza göre kullanılması koşuluyla aşağıdaki standartlar ve norm belirten belgelerle uyumludur:

EN60335-2-40,

01 following the provisions of:
02 gemäß den Vorschriften der:
03 conformément aux stipulations des:
04 overeenkomstig de bepalingen van:
05 siguiendo las disposiciones de:
06 secondo le prescrizioni per:
07 με τήρηση των διατάξεων των:
08 de acordo com o previsto em:
09 в соответствии с положениями:
10 under iagttagelse af bestemmelserne i:
11 enligt villkoren i:
12 gitt i henhold til bestemmelsene i:
13 noudattaen määräyksiä:
14 za dodržení ustanovení předpisu:
15 prema odredbama:
16 követi a(z):
17 zgodnie z postanowieniami Dyrektyw:
18 în urma prevederilor:
19 ob upoštevanju določb:
20 vastavalt nõuetele:
21 следвайки клаузите на:
22 laikantis nuostatų, pateikiamų:
23 ievērojot prasības, kas noteiktas:
24 održiavajúc ustanovenia:
25 bunun koşullarına uygun olarak:

Low Voltage 2006/95/EC
Machinery Safety 98/37/EC
Electromagnetic Compatibility 89/336/EEC *

01 Directives, as amended.
02 Direktiven, gemäß Änderung.
03 Directives, telles que modifiées.
04 Richtlijnen, zoals geamendeerd.
05 Directivas, según lo enmendado.
06 Direttive, come da modifica.
07 Οδηγιών, όπως έχουν τροποποιηθεί.
08 Directivas, conforme alteração em.
09 Директив со всеми поправками.
10 Direktiver, med senere ændringer.
11 Direktiv, med företagna ändringar.
12 Direktiver, med foretatte endringer.
13 Direktiivejä, sellaisina kuin ne ovat muutettuina.
14 v platném znění.
15 Smjernice, kako je izmijenjeno.
16 irányelv(ek) és módosításaik rendelkezéseit.
17 z późniejszymi poprawkami.
18 Directivelor, cu amendamentele respective.
19 Direktive z vsemi spremembami.
20 Direktiivid koos muudatustega.
21 Директиви, с техните изменения.
22 Direktyvose su papildymais.
23 Direktīvās un to papildinājumos.
24 Smernice, v platnom znení.
25 Değiştirilmiş halleriyle Yönetmelikler.

01 * as set out in the Technical Construction File **<A>** and judged positively by **<B>** according to the **Certificate <C>**.
02 * wie in der Technischen Konstruktionsakte **<A>** aufgeführt und von **<B>** positiv ausgezeichnet gemäß **Zertifikat <C>**.
03 * tel que stipulé dans le Fichier de Construction Technique **<A>** et jugé positivement par **<B>** conformément au **Certificat <C>**.
04 * zoals vermeld in het Technisch Constructiedossier **<A>** en in orde bevonden door **<B>** overeenkomstig **Certificaat <C>**.
05 * tal como se expone en el Archivo de Construcción Técnica **<A>** y juzgado positivamente por **<B>** según el **Certificado <C>**.
06 * delineato nel File Tecnico di Costruzione **<A>** e giudicato positivamente da **<B>** secondo il **Certificato <C>**.
07 * όπως προσδιορίζεται στο Αρχείο Τεχνικής Κατασκευής **<A>** και κρίνεται θετικά από το **<B>** σύμφωνα με το **Πιστοποιητικό <C>**.
08 * tal como estabelecido no Ficheiro Técnico de Construção **<A>** e com o parecer positivo de **<B>** de acordo com o **Certificado <C>**.
09 * как указано в Досье технического толкования **<A>** и в соответствии с положительным решением **<B>** согласно **Свидетельству <C>**.
10 * som anført i den Tekniske Konstruktionsfil **<A>** og positivt vurderet af **<B>** i henhold til **Certifikat <C>**.
11 * utrustningen är utförd i enlighet med den Tekniska Konstruktionsfilen **<A>** som positivt intygas av **<B>** vilket också framgår av **Certifikat <C>**.
12 * som det fremkommer i den Tekniske Konstruksjonsfilen **<A>** og gjennom positiv bedømmelse av **<B>** ifølge **Sertifikat <C>**.
13 * jotka on esitetty Teknisessä Asiakirjassa **<A>** ja jotka **<B>** on hyväksynyt **Sertifikaatin <C>** mukaisesti.
14 * jak bylo uvedeno v souboru technické konstrukce **<A>** a pozitivně zjištěno **<B>** v souladu s **osvědčením <C>**.
15 * kako je izloženo u Datoteci o tehničkoj konstrukciji **<A>** i pozitivno ocijenjeno od strane **<B>** prema **Certifikatu <C>**.
16 * a(z) **<A>** műszaki konstrukciós dokumentáció alapján, a(z) **<B>** igazolta a megfelelést a(z) **<C> tanúsítvány** szerint.
17 * zgodnie z archiwalną dokumentacją konstrukcyjną **<A>**, pozytywną opinią **<B>** i **Świadectwem <C>**.
18 * conform celor stabilite în Dosarul tehnic de construcţie **<A>** şi apreciate pozitiv de **<B>** în conformitate cu **Certificatul <C>**.
19 * kot je določeno v tehnični mapi **<A>** in odobreno s strani **<B>** v skladu s **certifikatom <C>**.
20 * nagu on näidatud tehnilises dokumentatsioonis **<A>** ja heaks kiidetud **<B>** järgi vastavalt **sertifikaadile <C>**.
21 * както е заложено в Акта за техническа конструкция **<A>** и оценено положително от **<B>** съгласно **Сертификат <C>**.
22 * kaip nurodyta Techninėje konstrukcijos byloje **<A>** ir patvirtinta **<B>** pagal **pažymėjimą <C>**.
23 * kā noteikts tehniskajā dokumentācijā **<A>**, atbilstoši **<B>** pozitīvajam lēmumam ko apliecina **sertifikāts <C>**.
24 * ako je to stanovené v Súbore technickej konštrukcie **<A>** a kladne posúdené **<B>** podľa **Certifikátu <C>**.
25 * **<A>** Teknik Yapı Dosyasında belirtildiği gibi ve **<C> sertifikasına** göre **<B>** tarafından olumlu olarak değerlendirilmiştir.

<A>	DAIKIN.TCF.024
<B>	TNO
<C>	0510260101

DAIKIN



Noboru Murata
Manager Quality Control Department
1st of April 2007

DAIKIN INDUSTRIES, LTD.
Umeda Center Bldg., 4-12, Nakazaki-Nishi 2-chome,
Kita-ku, Osaka, 530-8323 Japan

3P177868-1C

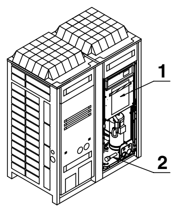


figure 1

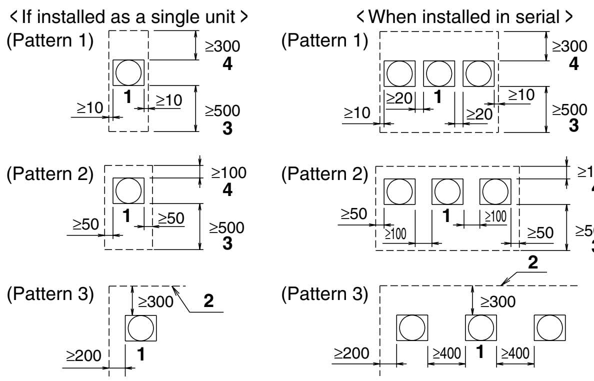


figure 2

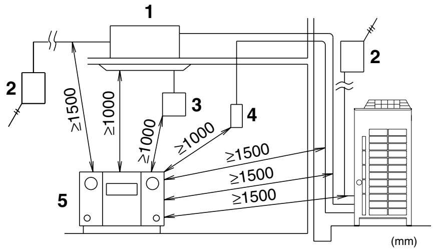


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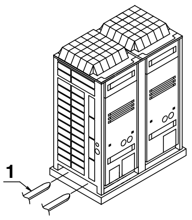


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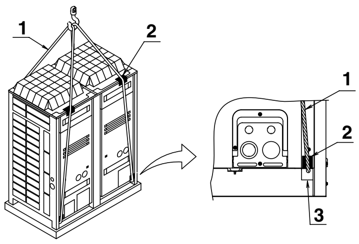


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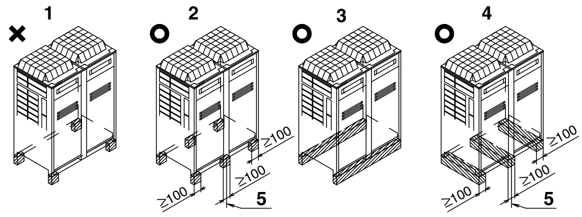


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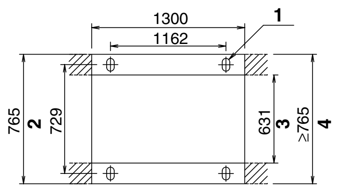


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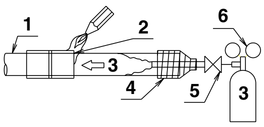


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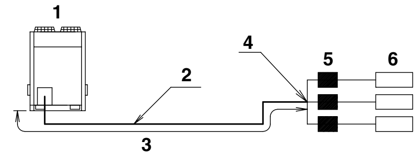


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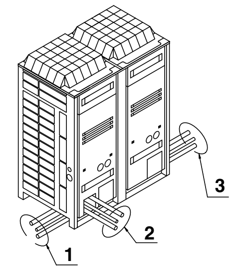


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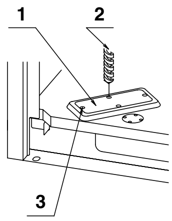


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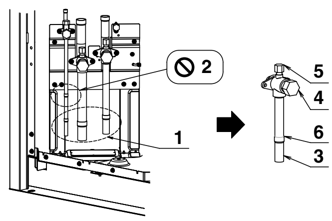


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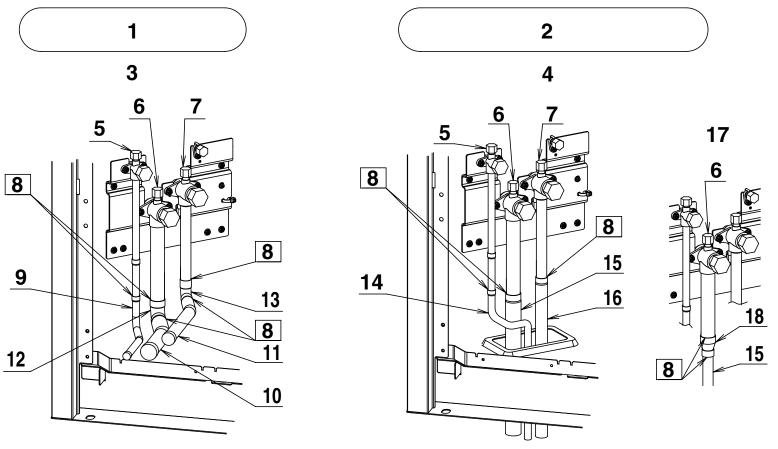


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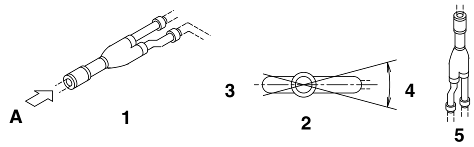


figure 14

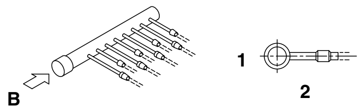


figure 15

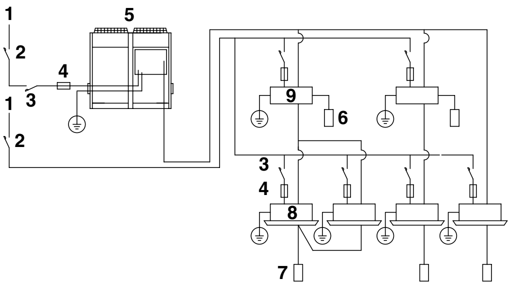


figure 17

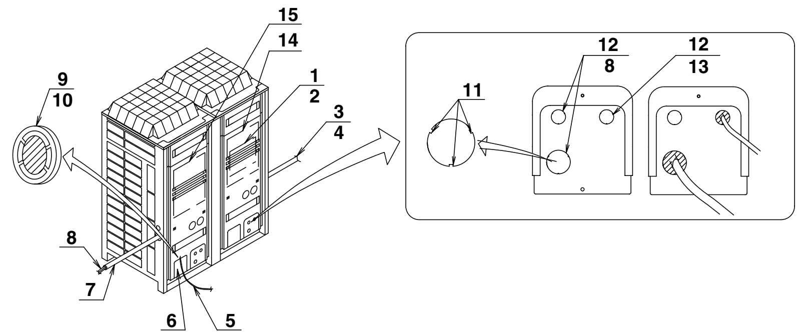


figure 18

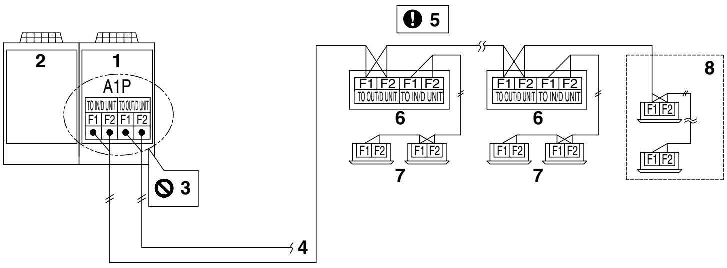


figure 19

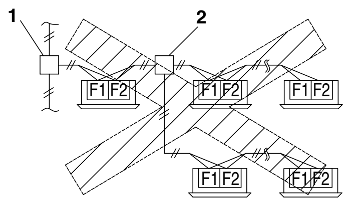


figure 20

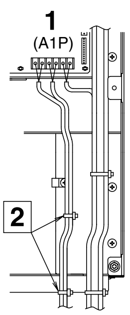


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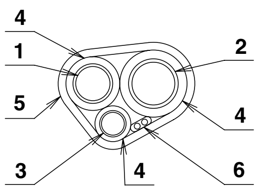


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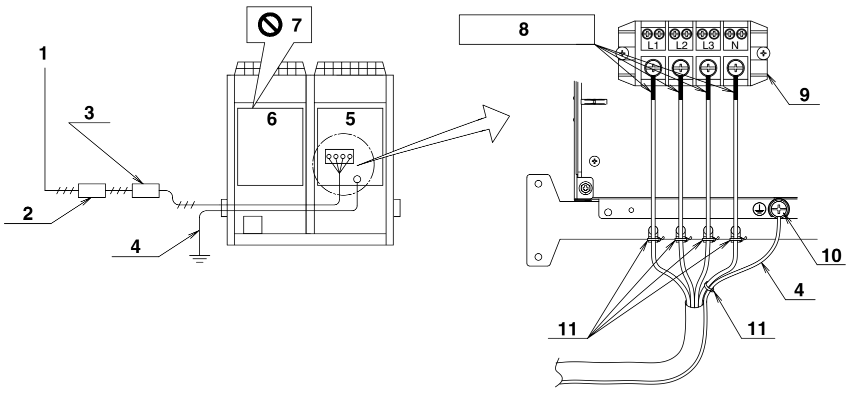


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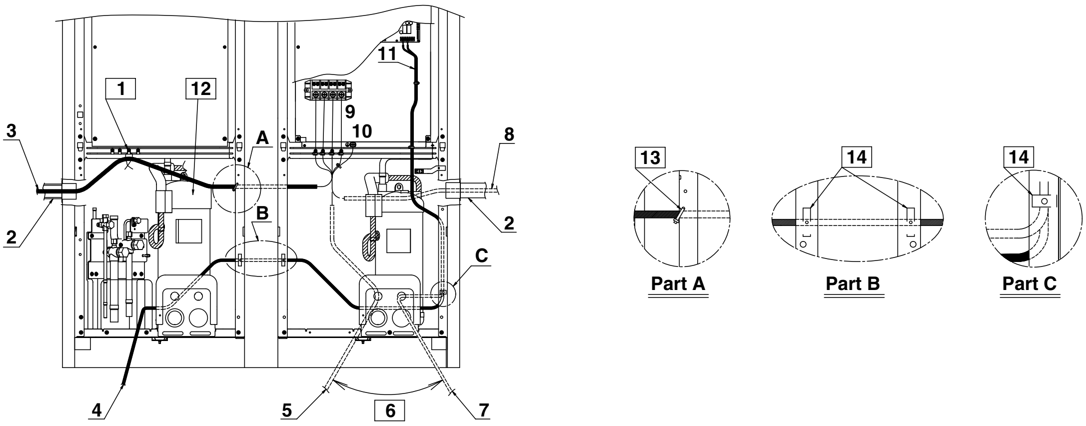


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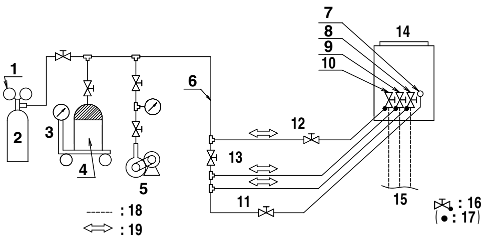


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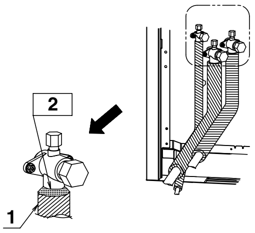


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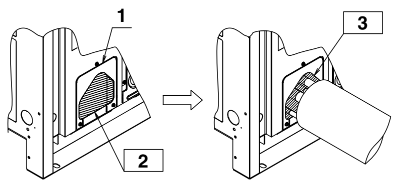


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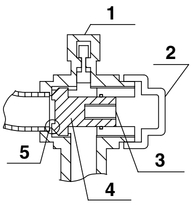


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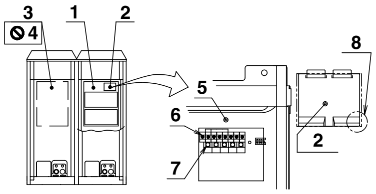


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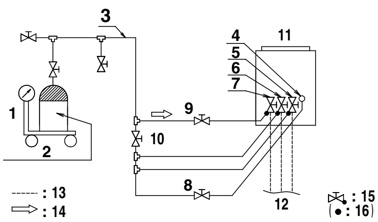


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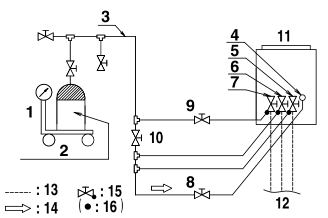


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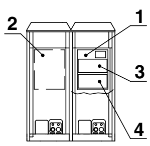


figure 32

CONTENTS

1. FIRST OF ALL

- This document is an installation manual for the Daikin REYQ-P Series VRV Inverter. Before installing the unit, read this manual thoroughly, and following the instructions contained in it.
  After installation, do a test run to make sure the unit runs properly, and then explain how to operate and take care of the unit to the customer, using the operation manual.
  Lastly, make sure the customer keeps this manual, along with the operation manual, in a safe place.

1-1 Safety considerations

Please read these “Safety considerations” carefully before installing air conditioning unit and be sure to install it correctly. The safety precautions listed here are divided into two categories.
In either case, important safety information is listed which must be read carefully.

⚠ **Warning**........Failure to observe a warning may result in death or serious injury.

⚠ **Caution**.........Failure to observe a caution may result in injury or damage to the unit.
These too might lead to serious injury depending on the circumstances.

⚠ Warning

- Ask your dealer or qualified personnel to carry out installation work. Do not try to install the machine yourself.
  Improper installation may result in water leakage, electric shocks or fire.
- Perform installation work in accordance with this installation manual.
  Improper installation may result in water leakage, electric shocks or fire.
- When installing the unit in a small room, take measures against to keep refrigerant concentration from exceeding allowable safety limits in the event of refrigerant leakage.
  Excessive refrigerant in a closed ambient can lead to oxygen deficiency. Contact your dealer for more information.
- Be sure to use only the specified accessories and parts for installation work.
  Failure to use the specified parts may result in water leakage, electric shocks, fire or the unit falling.
- Install the air conditioner on a foundation strong enough to withstand the weight of the unit.
  A foundation of insufficient strength may result in the unit falling and causing injuries.
- Carry out the specified installation work after taking into account strong winds, typhoons or earthquakes.
  Improper installation work may result in the unit falling and causing accidents.
- Make sure that a separate power supply circuit is provided for this unit and that all electrical work is carried out by qualified personnel according to local and national regulations and this installation manual.
  An insufficient power supply capacity or improper electrical construction may lead to electric shocks or fire.
- Be sure to establish an earth.
  Do not earth the unit to a utility pipe, arrester or telephone earth.
  Incomplete earth may cause electrical shock or fire.
  A high surge current from lightning or other sources may cause damage to the air conditioner.
- Be sure to install an earth leakage breaker.
  Failure to install an earth leakage breaker may result in electric shocks or fire.
- Before touching electrical parts, turn off the power.
  Failure to turn off the power may result in electric shocks.
- Make sure that all wiring is secured, the specified wires are used, and no external forces act on the terminal connections or wires.
  Improper connections or installation may result in the terminals overheating or fire.
- When wiring the power supply and connecting the remote controller wiring and transmission wiring, position the wires so that the EL.COMPO.BOX lid can be securely fastened.
  Improper positioning of the EL.COMPO.BOX lid may result in electric shocks or fire.
- If the refrigerant gas leaks during installation, ventilate the area immediately.
  Toxic gas may be produced if the refrigerant gas comes into contact with fire.
- After completing the installation work, check that the refrigerant gas does not leak.
  Toxic gas may be produced if the refrigerant gas leaks into the room and comes into contact with a source of fire, such as a fan heater, stove or cooker.
- Do not directly touch the refrigerant leaked from refrigerant piping connections.
  Frostbite may be caused.
- Do not allow children to mount on the outdoor unit, or avoid placing any object on it. Falling or tumble may result in injury.

⚠ Caution

- While following the instructions in this installation manual, install drain piping in order to ensure proper drainage and insulate piping in order to prevent condensation.
  Improper drain piping may result in water leakage and property damage.
- Install the indoor, BS and outdoor units, power supply wiring and connecting wiring at least 1 meter away from televisions or radios in order to prevent image interference or noise.
  (Depending on the radio waves, a distance of 1 meter may not be sufficient enough to eliminate the noise.)

- The indoor and BS unit should be installed as far away from fluorescent lighting as possible.
  Remote controller (wireless kit) transmitting distance can result shorter than expected in rooms with electronic fluorescent lamps (inverter or rapid start types).
- Do not install the air conditioner in the following locations:
  (a) where a mineral oil mist or an oil spray or vapor is produced, for example in a kitchen.
  Plastic parts may deteriorate and fall off or result in water leakage.
  (b) where corrosive gas, such as sulfurous acid gas, is produced. Corroding copper pipes or soldered parts may result in refrigerant leakage.
  (c) near machinery emitting electromagnetic waves.
  Electromagnetic waves may disturb the operation of the control system and result in a malfunction of the unit.
  (d) where flammable gas may leak, where there are carbon fiber or ignitable dust suspensions in the air, or where volatile flammables such as thinner or gasoline are handled.
  Operating the unit in such conditions may result in fire.
  (e) Locations where small animals might build nests inside the unit. If small animals enter and come in contact with electrical parts, this can cause malfunctions, smoke, and fire.

1-2 Special notice of product

[CLASSIFICATION]

This air conditioner comes under the term “appliances not accessible to the general public”.

[EMC CHARACTERISTICS]

VRVIII System is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

[REFRIGERANT]

VRVIII System use R410A refrigerant.

- The refrigerant R410A requires strict cautions for keeping the system clean, dry and tight.
  Read the chapter “REFRIGERANT PIPING” carefully and follow these procedures correctly.
  A.Clean and dry
  Foreign materials (including mineral oils such as SUNISO oil or moisture) should be prevented from getting mixed into the system.
  B.Tight
  Take care to keep the system tight when installing.
  R410A does not contain any chlorine, does not destroy the ozone layer, and does not reduce the earth’s protection against harmful ultraviolet radiation.
  R410A can contribute slightly to the greenhouse effect if it is released.
- Since R410A is a mixed refrigerant, the required additional refrigerant must be charged in its liquid state. If the refrigerant is charged in a state of gas, its composition changes and the system will not work properly.

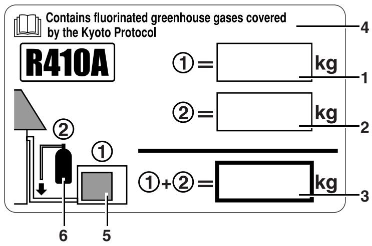
Limit by the total maximum refrigerant charge

The total maximum refrigerant charge of a VRVIII system must be below 100kg, this to be in accordance with CE requirement (EN60335-2-40 standard).
This means that in case the total maximum refrigerant charge of the system (factory and additional charge) is equal to or more than 100kg you must divide your multiple outdoor system into smaller independent systems, each containing less than 100kg refrigerant charge.
For factory charge, refer to the unit name plate.

Important information regarding the refrigerant used

This product contains fluorinated greenhouse gases covered by the Kyoto Protocol. Do not vent gases into the atmosphere.
Refrigerant type : R410A
GWP (1) value : 1975
(1) GWP = global warming potential
Please fill in with indelible ink,

- ① the factory refrigerant charge of the product,
- ② the additional refrigerant amount charged in the field and
- ① + ② the total refrigerant charge on the refrigerant charge label supplied with the product.
  The filled out label must be adhered in the proximity of the product charging port (e.g. onto the inside of the service cover).



1 factory refrigerant charge of the product : see unit name plate (2)
2 additional refrigerant amount charged in the field
3 total refrigerant charge
4 Contains fluorinated greenhouse gases covered by the Kyoto Protocol
5 outdoor unit
6 refrigerant cylinder and manifold for charging

(2) In case of multiple outdoor systems, only 1 label must be adhered, mentioning the total factory refrigerant charge of all outdoor units connected on the refrigerant system.

[DESIGN PRESSURE]

Since design pressure is 4.0MPa or 40bar (for R407C units : 3.3MPa or 33bar), the wall thickness of pipes should be more carefully selected in accordance with the relevant local and national regulations.

1-3 Disposal requirements

Dismantling of the unit, treatment of the refrigerant, oil and eventual other parts, should be done in accordance with the relevant local and national regulations.

2. INTRODUCTION

- REYQ-P series are designed for outdoor installation and used for cooling and heating aplications. The REYQ8-16P system is exclusive unit for single outdoor unit system. The unit can not use for independent unit of multi outdoor unit system.
  With this system, rated cooling capacity from 22.4kW to 45.0kW and rated heating capacity from 25.0kW to 50.0kW can be achieved.
- The BS units that combined with REYQ-P system for changing the refrigerant flow to indoor units are BSVQ100, 160, 250P type only. To combine with other type BS unit will cause malfunction.
- The indoor units that combined with REYQ-P system for air conditioning are Daikin VRV series indoor units that compatible with R410A. To learn which indoor units are compatible with R410A, refer to the product catalogs. To combine with other refrigerant indoor unit will cause malfunction.

2-1 Combination

- The indoor units can be installed in the following range.

〈Outdoor unit〉	〈Total capacity of indoor units〉
REYQ8PY1B	100 ~ 260
REYQ10PY1B	125 ~ 325
REYQ12PY1B	150 ~ 390
REYQ14PY1B	175 ~ 455
REYQ16PY1B	200 ~ 520

- If the total capacity of the connected indoor units exceeds the capacity of the outdoor unit, cooling and heating performance may drop when running the indoor units. See the capacity table in the Engineering Data Book for details.

2-2 Standard supplied accessories

Confirm the following accessories are included. The storage location of the accessories is shown in figure 1.

Note

Do not throw away any of the accessories until installation is complete. They are needed for installation work.

Name		Liquid side accessory pipe (1)	Liquid side accessory pipe (2)	Suction gas side accessory pipe (1)			Suction gas side accessory pipe (2)		
Quantity	8 type	1 pc.	1 pc.	1 pc.			1 pc.		
	10 type				1 pc.			1 pc.	
	12 type					1 pc.			1 pc.
	14·16 type					1 pc.			1 pc.
Shape				ϕ22.2	ϕ22.2	ϕ28.6	ϕ19.1	ϕ22.2	ϕ28.6

Name		HP / LP gas side accessory pipe (1)			HP / LP gas side accessory pipe (2)			L type accessory joint (1)	L type accessory joint (2)	accessory joint (2)
Quantity	8 type	1 pc.			1 pc.			1 pc.	1 pc.	1 pc.
	10 type		1 pc.			1 pc.				
	12 type		1 pc.			1 pc.				
	14·16 type			1 pc.			1 pc.			
Shape		ϕ15.9	ϕ19.1	ϕ22.2	ϕ15.9	ϕ19.1	ϕ22.2	ϕ25.4	ϕ19.1	

Name	Clamp(1)	Clamp(2)	Manuals, etc.
Quantity	9 pcs.	3 pcs.	1 pc. about each item
Shape			• Operation manual • Installation manual • Declaration of conformity (PED) • "REQUEST FOR THE INDICATON" label (Installation records) • "ADDITIONAL REF. CHARGE" label

(Refer to figure 1)

1. Clamps, Manuals, etc.
2. Accessory pipes

2-3 Option accessory

To install the outdoor units, the following optional parts are also required. To select an optimum kit, refer to "**6. REFRIGERANT PIPING**".

- **Refrigerant branching kit**

	for 3 piping			
REFNET header	–	KHRP25M33H	KHRP25M72H	KHRP25M73H
REFNET joint	KHRP25A22T	KHRP25A33T	KHRP25A72T	KHRP25A73T

	for 2 piping			
REFNET header	KHRP26M22H	KHRP26M33H	KHRP26M72H	KHRP26M73H
REFNET joint	KHRP26A22T	KHRP26A33T	KHRP26A72T	–

- **Pipe size reducer**

	for 3 piping		for 2 piping
for REFNET header	KHRP25M72HP	KHRP25M73HP	KHRP26M73HP
for REFNET joint	KHRP25M72TP	KHRP25M73TP	–

Make sure that any separately purchased accessories are designed for use with R410A.

2-4 Technical and Electrical specifications

Refer to the Engineering Data Book for the complete list of specifications.

2-5 Main components

For main components and function of the main components, refer to the Engineering Data Book.

3. SELECTION OF LOCATION

Select a location for installation that meets the following conditions and get the customer's permission.

1. There is no danger of fire due to leakage of inflammable gas.
2. Select the location of the unit in such a way that neither the discharged air nor the sound generated by the unit disturb anyone.
3. The foundation is strong enough to support the weight of the unit and the floor is flat to prevent vibration and noise generation.
4. The piping length between the outdoor unit and the indoor unit may not exceed the allowable piping length.
   (Refer to "**6. REFRIGERANT PIPING**")
5. Locations where the unit's suction vent and outlet vent do not generally face the wind.
   Wind blowing directly into the suction or outlet vents will interfere with the unit's operation.
   If necessary, install some kind of obstruction to block the wind.
6. The space around the unit is adequate for servicing and the minimum space for air inlet and air outlet is available.
   (See the "**Installation Space Examples**" for the minimum space requirements.)

Installation Space Examples

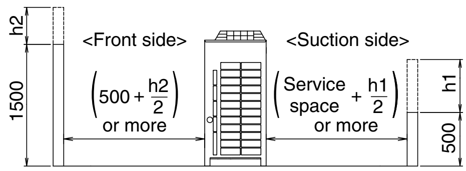
- The installation space requirement shown in figure 2 is a reference for cooling operation when the outdoor temperature is 35°C. If the design outdoor temperature exceeds 35°C or the heat load exceeds maximum capacity in all the outdoor unit, take an even large space on the intake shown in figure 2.
- During installation, install the units using the most appropriate of the patterns shown in figure 2 for the location in question, taking into consideration human traffic and wind.
- If the number of units installed is more than that shown in the pattern in figure 2, install the units so there are no short circuits.
- As regards space in front of the unit, consider the space needed for the local refrigerant piping when installing the units.
- If the work conditions in figure 2 do not apply, contact your dealer or Daikin directly.

(Refer to figure 2)

1. Front side
2. No limit to wall height
3. Service space of front side
4. Service space of suction side

For Patterns 1 and 2 in figure 2 :

- Wall height for front side – no higher than 1500 mm.
- Wall height on the suction side – no higher than 500 mm.
- Wall height for sides – no limit.
- If the height is exceeded the above, calculate h1 and h2 shown in the figure below, and add h2/2 to the service space of front side and h1/2 to the service space of suction side.



Note

1. An inverter air conditioner may cause electronic noise generated from AM broadcasting. Examine where to install the main air conditioner and electric wires, keeping proper distances away from stereo equipment, personal computers, etc.
   Particularly for locations with weak reception, ensure there is a distance of at least 3 meters for indoor remote controllers, place power wiring and transmission wiring in conduits, and ground the conduits.

   (Refer to figure 3)

   1. Indoor unit
   2. Branch switch, overcurrent breaker
   3. Remote controller
   4. COOL/HEAT selector
   5. Personal computer or radio
2. When installing in a locations where there is heavy snowfall, implement the following snow measures.
   - Ensure the base is high enough that intakes are not clogged by snow.
   - Remove the rear intake grille to prevent snow from accumulating on the fins.
3. If condensate may drip on downstairs (or walkway) depending on the floor condition, take a measure such as the installation of central drain pan kit (sold separately).

4. The refrigerant R410A itself is nontoxic, nonflammable and is safe. If the refrigerant should leak however, its concentration may exceed the allowable limit depending on room size. Due to this it could be necessary to take measures against leakage. See “**14. CAUTION FOR REFRIGERANT LEAKS**” for details.

4. INSPECTING AND HANDLING THE UNIT

- At delivery, the package should be checked and any damage should be reported immediately to the carrier claims agent.
- When handling the unit, take into account the following:

1. Fragile, handle the unit with care.
   Keep the unit upright in order to avoid compressor damage.
2. Decide on the transportation route.
3. If a forklift is to be used, insert the arms into the lower side. **(Refer to figure 4)**
4. If hanging the unit, use a cloth sling to prevent damaging the unit. Keeping the following points in mind, hang the unit following the procedure shown in figure 5.
   - Use a sling sufficiently strong to hold the mass of the unit.
   - Use 2 belts of at least 8m long.
   - Place extra cloth or boards in the locations where the casing comes in contact with the sling to prevent damage.
   - Hoist the unit making sure it is being lifted at its center of gravity.

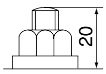
(Refer to figure 4)
1. Fork

(Refer to figure 5)
1. Belt sling
2. Filler cloth or Board
3. Hole (small)

Note
- Apply a filler cloth on a fork to prevent coating of the bottom frame from coming off and rust from occurring when bringing the unit using a forklift.
- Insert the arms even the tip of arms come out fully from opposite side.

5. PLACING THE UNIT

- Make sure the unit is installed level on a sufficiently strong base to prevent vibration and noise. **(Refer to figure 6)**
- The base should support the unit with the extent larger than hatched area in figure 7.
  If protective rubber is to be attached, attach it to the whole face of the base.
- The height of the base should be at least 150mm from the floor.
- Secure the unit to its base using foundation bolts. (Use four commercially available M12-type foundation bolts, nuts, and washers.)
- The foundation bolts should be inserted 20 mm.

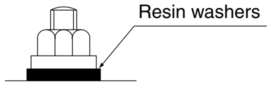


(Refer to figure 6)
1. Independent base (four corner type)
2. Independent base (with center support type)
3. Beam base (Horizontal)
4. Beam base (Vertical)
5. Center of the product

(Refer to figure 7)
1. 4-15×22.5 (Hole for foundation bolt)
2. (Depth of product)
3. (Inner dimension of the base)
4. (Outer dimension of the base)

Note
- When installing central drain pan kit (optional accessory), construct the bace by independent base (with center support type) or beam base (Horizontal) in figure 6.
- There are restrictions on the refrigerant pipe connecting order between outdoor unit in the case of the multi system.
  See “**2-1 Combination**” for detail.
- When installing on a roof, make sure the roof floor is strong enough and be sure to water-proof all work.
- Make sure the area around the machine drains properly by setting up drainage grooves around the foundation.
  Drain water is sometimes discharged from the outdoor unit when it is running.

- For anti-corrosion type, use nuts with resin washers. If the paint on nut connections comes off, the anti-corrosion effect may decrease.



6. REFRIGERANT PIPING

Note
- All field piping must be installed by a licensed refrigeration technician and must comply with relevant local and national regulations.
- After piping work is complete, do not under any circumstances open the shutoff valve until “**7. FIELD WIRING**” and “**10. CHECKING OF DEVICE AND INSTALLATION CONDITIONS**” are complete.
- Do not use flux when brazing the refrigerant piping. Use the phosphor copper brazing filler metal (BCuP-2 : JIS Z 3264, B-Cu93P-710/795 : ISO 3677) which does not require flux.
  (Flux has extremely harmful influence on refrigerant piping systems. For instance, if the chlorine based flux is used, it will cause pipe corrosion or, in particular, if the flux contains fluorine, it will damage the refrigerant oil.)

6-1 Selection of piping material and Refrigerant branching kit

- Use only pipes which are clean inside and outside and which do not accumulate harmful sulfur, oxidants, dirt, cutting oils, moisture, or other contamination. (Foreign materials inside pipes including oils for fabrication must be 30mg/10m or less.)
- Use the following items for the refrigerant piping.
  Material : Jointless phosphor-deoxidized copper pipe
  Size : See “**6-5 Example of connection**” to determine the correct size.
  Thickness : Select a thickness for the refrigerant piping which complies with national and local laws.
  For R410A, the design pressure is 4.0 MPa (40-bar).
  The minimum thickness of piping according to Japan’s High-Pressure Gas Safety Law (as of January 2003) is shown below.
  Temper grade (O type, 1/2H type) in the table indicate the material types specified in JIS H 3300.

(unit : mm)

Temper grade	O type			
outer diameter	ϕ6.4	ϕ9.5	ϕ12.7	ϕ15.9
smallest thickness	0.80	0.80	0.80	0.99

(unit : mm)

Temper grade	1/2H type							
outer diameter	ϕ19.1	ϕ22.2	ϕ25.4	ϕ28.6	ϕ31.8	ϕ34.9	ϕ38.1	ϕ41.3
smallest thickness	0.80	0.80	0.88	0.99	1.10	1.21	1.32	1.43

- For piping work, follow the maximum tolerated length, difference in height, and length after a branch indicated in the “**6-5 Example of connection**”.
- Outdoor unit multi connection piping kit and refrigerant branching kit (sold separately) are needed for connection of piping between outdoor units (in case of multi system) and piping branches.
  Use only separately sold items selected specifically according to the outdoor unit multi connection piping kit, the refrigerant branching kit selection in the “**6-5 Example of connection**”.

6-2 Protection against contamination when installing pipes

Protect the piping to prevent moisture, dirt, dust, etc. from entering the piping.

Place	Installation period	Protection method
Outdoor	More than a month	Pinch the pipe
	Less than a month	Pinch or tape the pipe
Indoor	Regardless of the period	

Note
Exercise special caution to prevent dirt or dust when passing piping through holes in walls and when passing pipe edges to the exterior.

6-3 Pipe connection

- Be sure to perform nitrogen permutation or nitrogen blow when brazing. **(Refer to figure 8)**
  Brazing without performing nitrogen permutation or nitrogen blow into the piping will create large quantities of oxidized film on the inside of the pipes, adversely affecting valves and compressors in the refrigerating system and preventing normal operation.

  (Refer to figure 8)
  1. Refrigerant pipe
  2. Location to be brazed
  3. Nitrogen
  4. Taping
  5. Handy valve
  6. Regulator
- The pressure regulator for the nitrogen released when doing the brazing should be set to about 0.02 MPa (0.2kg/cm^2: Enough to feel a slight breeze on your cheek).

Note
Do not use anti-oxidants when brazing the pipe joints.
Residue can clog pipes and break equipment.

6-4 Connecting the refrigerant piping

1. Direction to bring out the pipes
The local interunit piping can be connected either forward or to the sides (taken out through the bottom) as shown in the figure 10. When passing out through the bottom, use the knock hole in the bottom frame.

(Refer to figure 10)
1. Left-side connection
2. Front connection
3. Right-side connection

Precautions when knocking out knock holes
- Open knock hole in the base frame by drilling the 4 concave around it with a 6mm bit. **(Refer to figure 11)**

  (Refer to figure 11)
  1. Knock hole
  2. Drill
  3. Concave section (4 points)
- Be sure to avoid damaging the casing
- After knocking out the holes, we recommend you remove any burrs and paint them using the repair paint to prevent rusting.
- When passing electrical wiring through the knock holes, protect the wiring with a conduit or bushings, making sure not to damage the wiring.

2. Removing Pinch Piping
- When connecting refrigerant piping to an outdoor unit, remove the pinch piping using the procedure in the figure 12. **(Refer to figure 12)**
- About handling of shutoff valves, refer to [Shutoff valve operation procedure] in "**11-1 Before working**".

Caution
After removing the gass, remove the pinch piping.
Any gas remaining inside may blow off the pinch piping when you dissolve the brazing, causing damage.

(Refer to figure 12)
1. Pich piping (4 pieces)
2. Do not remove the relay piping.
3. Pinch piping
4. Procedure 1 : Confirm the shutoff valve is closed.
5. Procedure 2 : Connect a charge hose to the service port of shutoff valve and remove the gas in the pinch piping.
6. Procedure 3 : After removing the gas in the pinch piping, dissolve the brazing using a burner and remove the pinch piping.

3. Connecting refrigerant piping to outdoor units
- Figure 13 shows the example of connecting refrigerant piping to outdoor units.
- The local interunit piping next accesorry pipes are field supplied.

(Refer to figure 13)
1. When connected to the front
2. When connected at lateral side (bottom)
3. Remove the shutoff valve cover to connect.
4. Remove the knock hole on the bottom frame and route the piping under the bottom frame.
5. Liquid pipe shutoff valve
6. Suction gas pipe shutoff valve
7. HP/LP gas pipe shutoff valve
8. Brazing
9. Liquid side accessory pipe (1)
10. Suction gas side accessory pipe (1)
11. HP/LP gas side accessory pipe (1)
12. L type accessory joint (1)
13. L type accessory joint (2)
14. Liquid side accessory pipe (2)
15. Suction gas side accessory pipe (2)
16. HP/LP gas side accessory pipe (2)
17. In case of Q8 type use the Accessory joint for connecting the Suction gas side accessory pipe (2) to Suction gas side shutoff valve.
18. Accessory joint

Note
- Make sure the onsite piping does not come into contact with other piping or the bottom frame or side panels of the unit.

4. Branching the refrigerant piping
Heed the restrictions below when installing the refrigerant branching kit and read the installation instruction manual with the kit. (Improper installation could lead to malfunctioning or breakdown of the outdoor unit.)

<REFNET joint>
Install the REFNET joint so it splits horizontally or vertically.

(Refer to figure 14)
1. Horizontal
2. A-arrow view
3. Horizontal surface
4. ±30° or less
5. Vertical

<REFNET header>
Install the REFNET header so it splits horizontally.

(Refer to figure 15)
1. Horizontal surface
2. B-arrow view

6-5 Example of connection

Example of connection
(Connection of 8 indoor units)

Outdoor unit side ① — BS Unit — ② Indoor unit side

① Piping from outdoor unit to BS unit

(Bold): 3 pipes { Suction gas pipe / HP/LP gas pipe / Liquid pipe

② Piping from BS unit to indoor unit or Piping from Refrigerant branch kit to indoor unit used as cooling only

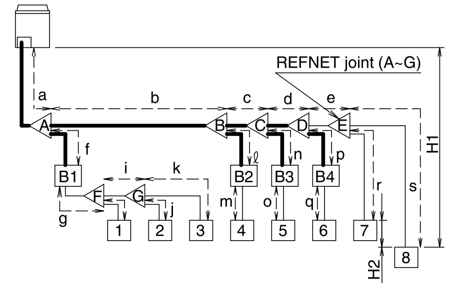
(Thin): 2 pipes { (Suction) gas pipe / Liquid pipe

(*1) " " Indicate the Outdoor unit multi connection piping kit.

(*2) In case of multi outdoor system, re-read "outdoor unit" to "the first Outdoor unit multi connection piping kit" as seen from the indoor unit.

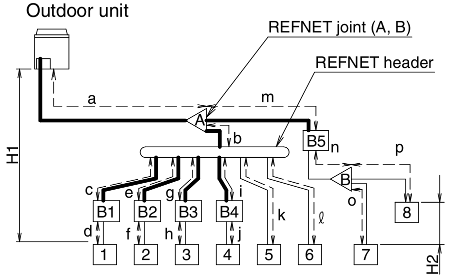
Single outdoor system (REYQ 8~16)

Branch with REFNET joint



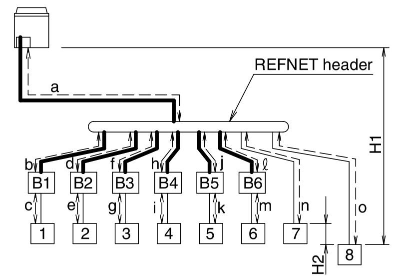
B1 ~ B4 : BS Unit
1 ~ 6 : Indoor unit (Cool/Heat selection possible)
7, 8 : Indoor unit (Cooling only)

Branch with REFNET joint and header



B1 ~ B5 : BS Unit
1 ~ 4, 7, 8 : Indoor unit (Cool/Heat selection possible)
5, 6 : Indoor unit (Cooling only)

Branch with REFNET header

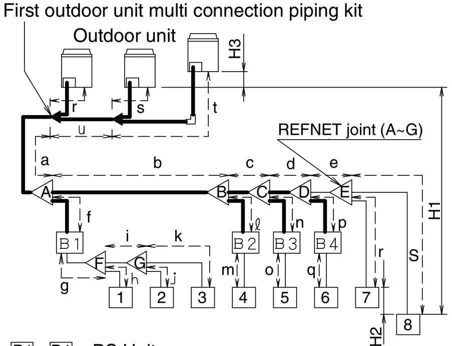


B1 ~ B4 : BS Unit
1 ~ 6 : Indoor unit (Cool/Heat selection possible)
7, 8 : Indoor unit (Cooling only)

Multi outdoor system (REYQ 18~48)

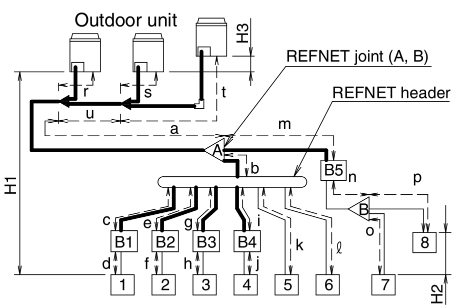
Branch with REFNET joint

First outdoor unit multi connection piping kit



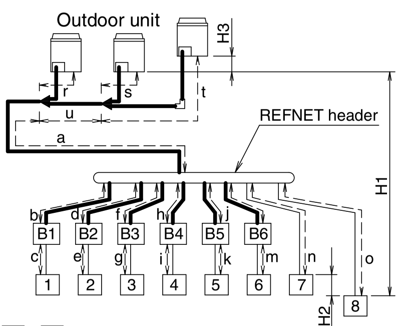
B1 ~ B4 : BS Unit
1 ~ 6 : Indoor unit (Cool/Heat selection possible)
7, 8 : Indoor unit (Cooling only)

Branch with REFNET joint and header



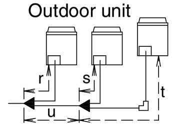
B1 ~ B5 : BS Unit
1 ~ 4, 7, 8 : Indoor unit (Cool/Heat selection possible)
5, 6 : Indoor unit (Cooling only)

Branch with REFNET header



B1 ~ B4 : BS Unit
1 ~ 6 : Indoor unit (Cool/Heat selection possible)
7, 8 : Indoor unit (Cooling only)

Allowable lengths

			Branch with REFNET joint	Branch with REFNET joint and header	Branch with REFNET header
Maximum allowable length	Between outdoor unit (*2) and indoor unit	Actual pipe length	Pipe length between outdoor unit (*2) and indoor unit ≤ 165m		
			Example 8 : a + b + c + d + e + s ≤ 165m	Example 6 : a + b + ℓ ≤ 165m, 8 : a + m + n + p ≤ 165m	Example 8 : a + o ≤ 165m
		Equivalent length	Equvalent pipe length between outdoor unit (*2) and indoor unit ≤ 190m (Note 1) (Assume eqivalent pipe length of REFNET joint to be 0.5m, that of REFNET header to be 1m, that of BSVQ100, 160 to be 4m, that of BSVQ250 to be 6m for calculation purposes)		
		Total extention length	Total piping length from outdoor unit (*2) to all indoor unit ≤ 1000m		
	Between first outdoor unit multi connection piping kit and outdoor unit (in case of multi system)	Actual and Equivalent pipe length	Actual pipe length from first outdoor unit multi connection piping kit to outdoor unit ≤ 10m Equivalent pipe length from first outdoor unit multi connection piping kit to outdoor unit ≤ 13m		Outdoor unit  r ≤ 10m (Equivalent length ≤ 13m) u + s ≤ 10m (Equivalent length ≤ 13m) u + t ≤ 10m (Equivalent length ≤ 13m)
Allowable height difference	Between outdoor and indoor units	Difference in height	Difference in height between outdoor unit and indoor unit (H1) ≤ 50m (Max 40m if the outdoor unit is below)		
	Between indoor and indoor units	Difference in height	Difference in height between adjacent indoor units (H2) ≤ 15m		
	Between outdoor and outdoor units	Difference in height	Difference in height between adjacent outdoor units (H3) ≤ 5m		
Allowable length after the branch		Actual pipe length	Actual pipe length from first refrigerant branch kit (either REFNET joint or REFNET header) to indoor unit ≤ 40m (Note 2)		
			Example 8 : b + c + d + e + s ≤ 40m	Example 6 : b + ℓ ≤ 40m, 8: m + n + p ≤ 40m	Example 8 : o ≤ 40m

Outdoor unit multi connection piping kit and Refrigerant branch kit selection

- Refrigerant branch kits can only be used with R410A.
- When multi outdoor system are installed, be sure to use the special separately sold Outdoor unit multi connection piping kit. (BHFP26P90 · 136).
  (For how to select the proper kit, follow the table at right.)
- Never use BHFP26M90 · 135, BHFP22M90 · 135P for M type of this series or T joint (field supplyed).

How to select the REFNET joint

- When using REFNET joint at the first branch counted from the outdoor unit side, choose from the following table in accordance with the outdoor unit capacity type. (Example : REFNET joint A)

Outdoor unit capacity type	Refrigerant branch kit name
8,10HP type	KHRP25A33T
12~22HP type	KHRP25A72T+KHRP25M72TP
24HP type ~	KHRP25A73T+KHRP25M73TP

- Choose the REFNET joints other than the first branch from the following table in accordance with the total capacity index of all the indoor units connected below the REFNET joint.

Indoor unit total capacity index	Refrigerant branch kit name	
	3 pipes	2 pipes
x < 200	KHRP25A22T	KHRP26A22T
200 ≤ x < 290	KHRP25A33T	KHRP26A33T
290 ≤ x < 640	KHRP25A72T+KHRP25M72TP	KHRP26A72T
640 ≤ x	KHRP25A73T+KHRP25M73TP	—

How to select the REFNET header

- Choose from the following table in accordance with the total capacity index of all the indoor units connected below the REFNET header.
- 250 type indoor unit can not be connected below the REFNET header.

Indoor unit total capacity index	Refrigerant branch kit name	
	3 pipes	2 pipes
x < 200	KHRP25M33H	KHRP26M22H or KHRP26M33H
200 ≤ x < 290		KHRP26M33H
290 ≤ x < 640	KHRP25M72H+KHRP25M72HP	KHRP26M72H
640 ≤ x	KHRP25M73H+KHRP25M73HP	KHRP26M73H+KHRP26M73HP

How to select the outdoor unit multi connection piping kit
(This is required when the system is multi outdoor unit system.)

- Choose from the following table in accordance with the number of outdoor units.

Number of outdoor unit	Connecting piping kit name
2 units	BHFP26P90
3 units	BHFP26P136

Example for indoor units connected downstream

Example REFNET joint C : Indoor units 5 + 6 + 7 + 8

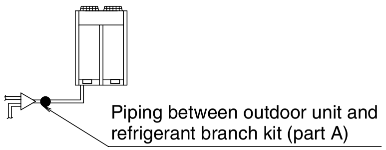
Example REFNET joint B : Indoor units 7 + 8
Example REFNET header : Indoor units 1 + 2 + 3 + 4 + 5 + 6

Example REFNET header :
Indoor units 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8

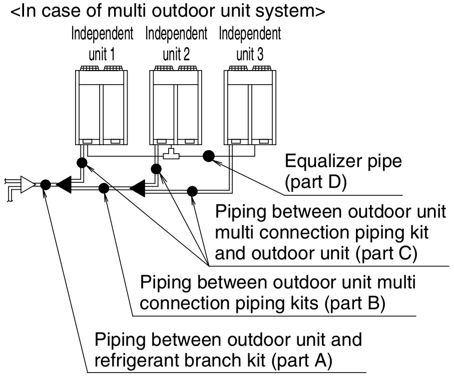
Pipe size selection

⚠ The thickness of the pipes in the table shows the requirements of Japanease High Pressure Gas Controll low. (As of Jan. 2003)
The thickness and material shall be selected in accordance with local code.

<In case of single outdoor unit system>



<In case of multi outdoor unit system>



Piping between outdoor unit (*2) and refrigerant branch kit (part A)

- Choose from the following table in accordance with the outdoor unit system capacity type.

Piping between outdoor unit multi connection piping kits (part B)

- Choose from the following table in accordance with the total capacity of all the outdoor units connected upstream.

(unit : mm)

Outdoor unit capacity type	Piping size (O. D.)		
	Suction gas pipe	HP/LP gas pipe	Liquid pipe
8HP type	φ19.1	φ15.9	φ9.5
10HP type	φ22.2	φ19.1	
12HP type	φ28.6		φ12.7
14,16HP type		φ22.2	
18HP type			φ15.9
20,22HP type		φ28.6	
24HP type	φ34.9		
26~34HP type			
36HP type	φ41.3		φ19.1
38~48HP type		φ34.9	

Piping between outdoor unit multi connection piping kit and outdoor unit (part C)

- Choose from the following table in accordance with the capacity type of the outdoor unit connected.

(unit : mm)

Outdoor unit capacity type	Piping size (O. D.)		
	Suction gas pipe	HP/LP gas pipe	Liquid pipe
8,10HP type	φ22.2	φ19.1	φ9.5 × 0.8
12HP type	φ28.6		φ12.7
14,16HP type		φ22.2	

Piping between refrigerant branch kits
Piping between refrigerant branch kit and BS unit
Piping between BS unit and refrigerant branch kit

- Choose from the following table in accordance with the total capacity type of all the indoor units connected downstream.

*1 Connection piping must not exceed the refrigerant Piping size between outdoor unit and refrigerant branch kit (part A).
*2 When selecting 2 pipes line (gas pipe and liquid pipe), use Suction gas pipe column for gas pipe and Liquid pipe column for liquid pipe.

(unit : mm)

Indoor capacity index	Piping size (O. D.)		
	Suction gas pipe	HP/LP gas pipe	Liquid pipe
x < 150	φ15.9	φ12.7	φ9.5
150 ≤ x < 200	φ19.1	φ15.9	
200 ≤ x < 290	φ22.2	φ19.1	
290 ≤ x < 420	φ28.6		φ12.7
420 ≤ x < 640		φ28.6	φ15.9
640 ≤ x < 920	φ34.9		φ19.1
920 ≤ x	φ41.3		

Piping between refrigerant branch kit, BS unit and indoor unit

- Match to the size of the connection piping on the indoor unit.

(unit : mm)

Indoor unit capacity type	Piping size (O. D.)	
	gas pipe	Liquid pipe
20 · 25 · 32 · 40 · 50 type	φ12.7	φ6.4
63 · 80 · 100 · 125 type	φ15.9	φ9.5
200 type	φ19.1	
250 type	φ22.2	

Equalizer pipe (part D) (multi outdoor unit system only)

(unit : mm)

Piping size (O. D.)	φ19.1

Temper grade and wall thickness for pipes
(Temper grade, O type and 1/2H type indicate the material type specified in JIS H 3300.)

Copper tube O. D.	φ6.4	φ9.5	φ12.7	φ15.9	φ19.1	φ22.2	φ25.4	φ28.6	φ31.8	φ34.9	φ38.1	φ41.3
Temper grade	O type				1/2H type							
Wall thickness (Min. requirement)	0.80	0.80	0.80	0.99	0.80	0.80	0.88	0.99	1.10	1.21	1.32	1.43

How to calculate the additional refrigerant to be charged

Additional refrigerant to be charged : R(kg)
(R should be rounded off in units of 0.1 kg.)

$$R = \Big[(\text{Total length(m) of liquid piping size at } \phi 22.2) \times 0.37 + (\text{Total length(m) of liquid piping size at } \phi 19.1) \times 0.26$$
$$+ (\text{Total length(m) of liquid piping size at } \phi 15.9) \times 0.18 + (\text{Total length(m) of liquid piping size at } \phi 12.7) \times 0.12$$
$$+ (\text{Total length(m) of liquid piping size at } \phi 9.5) \times 0.059 + (\text{Total length(m) of liquid piping size at } \phi 6.4) \times 0.022 \Big] \times 1.02 + \text{(Heat recover system)} + \text{(Refrigerant amount for exceeding connection capacity)}$$

HEAT RECOVER SYSTEM	
MODEL NAME	THE AMOUNT OF REFRIGERANT
REYQ8 ~ 16PY1	3.6kg
REYQ18 ~ 20PY1	1.0kg
REYQ22 ~ 24PY1	1.5kg
REYQ26PY1	2.0kg
REYQ28 ~ 30PY1	2.5kg
REYQ32 ~ 40PY1	3.0kg
REYQ42PY1	3.5kg
REYQ44 ~ 46PY1	4.0kg
REYQ48PY1	4.5kg

REFRIGERANT AMOUNT FOR EXCEEDING CONNECTION CAPACITY OF INDOOR UNIT		
INDOOR CONNECTION CAPACITY	MODEL NAME	
	REYQ8 ~ 32PY1	REYQ34 ~ 48PY1
MORE THAN 100% 120% OR LESS	0.5kg	
MORE THAN 120% 130% OR LESS	0.5kg	1.0kg

Example for refrigerant branch using REFNET joint and REFNET header for the systems and each pipe length as shown below.

Outdoor system : REYQ34PY1
Total capacity of indoor unit : 116%

a : ϕ19.1 × 30m	e : ϕ9.5 × 10m	i : ϕ9.5 × 10m	m : ϕ9.5 × 20m	r : ϕ12.7 × 3m
b : ϕ19.1 × 20m	f : ϕ9.5 × 10m	j : ϕ9.5 × 10m	n : ϕ9.5 × 10m	s : ϕ9.5 × 3m
c : ϕ9.5 × 10m	g : ϕ9.5 × 10m	k : ϕ9.5 × 20m	o : ϕ6.4 × 10m	t : ϕ9.5 × 3m
d : ϕ9.5 × 10m	h : ϕ9.5 × 10m	l : ϕ9.5 × 20m	p : ϕ6.4 × 10m	u : ϕ15.9 × 1m

R = ([50 × 0.26] (a, b) + [1 × 0.18] (u) + [3 × 0.12] (r) + [156 × 0.059] (c~n, s, t) + [20 × 0.022] (o, p)) × 1.02 + [3.0] (REYQ34PY1) + [0.5] (116%)

= 27.148 ⟹ [27.1kg]

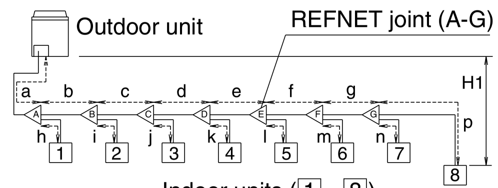
Round off in units of 0.1 kg.

Note 1.
When the equivalent pipe length between outdor and indoor units is 90m or more, the size of main pipes on the liquid side (refer to figure 9) must be increased according to the right table.
(Never increase suction gas pipe and HP/LP gas pipe.)

(Refer to figure 9)
1.Outdoor unit
2.Main pipes
3.Increase only liquid pipe size
4.First refrigerant branch kit
5.BS unit
6.Indoor unit

System	Liquid pipe
REYQ8 ~ 10PY1	ϕ9.5 → ϕ12.7
REYQ12 ~ 16PY1	ϕ12.7 → ϕ15.9
REYQ18 ~ 24PY1	ϕ15.9 → ϕ19.1
REYQ26 ~ 48PY1	ϕ19.1 → ϕ22.2

Note 2. Allowable length after the first refrigerant branch kit to indoor units is 40m or less, however it can be extended up to 90m if all the following conditions are satisfied. (In case of "**Branch with REFNET joint**")

Required Conditions	Example Drawings	
1. It is necessary to increase the pipe size between the first branch kit and the final branch kit. (Reducers must be procured on site) However, the pipes that are same pipe size with main pipe must not be increased.	[8] b+c+d+e+f+g+p≤ 90 m increase the pipe size of b, c, d, e, f, g	Increase the pipe size as follows ϕ 9.5 → ϕ12.7 ϕ15.9 → ϕ19.1 ϕ22.2 → ϕ25.4* ϕ34.9 → ϕ38.1* ϕ12.7 → ϕ15.9 ϕ19.1 → ϕ22.2 ϕ28.6 → ϕ31.8*
2. For calculation of Total extension length, the actual length of above pipes must be doubled. (except main pipe and the pipes that are not increased)	a+b×2+c×2+d×2+e×2+f×2+g×2 +h+i+j+k+l+m+n+p≤ 1000 m	
3. Indoor unit to the nearest branch kit ≤ 40 m	h, i, j...... p ≤ 40 m	
4. The difference between [Outdoor unit to the farthest indoor unit] and [Outdoor unit to the nearest indoor unit] ≤ 40 m	The farthest indoor unit [8] The nearest indoor unit [1] (a+b+c+d+e+f+g+p)-(a+h)≤ 40 m	

*If available on the site, use this size. Otherwise it can not be increased.

7. FIELD WIRING

Caution

- All field wiring and components must be installed by a licensed electrician and must comply with relevant local and national regulations.
- Be sure to use a dedicated power circuit. Never use a power supply shared by another appliance.
- Never install a phase advancing capacitor. As this unit is equipped with an inverter, installing a phase advancing capacitor will not only deteriorate power factor improvement effect, but also may cause capacitor abnormal heating accident due to high-frequency waves.
- Only proceed with wiring work after blocking off all power.
- Always ground wires in accordance with relevant local and national regulations.
- This machine includes an inverter device. Connect earth and leave charge to eliminate the impact on other devices by reducing noise generated from the inverter device and to prevent leaked current from being charged in the outer hull of the product.
- Do not connect the ground wire to gas pipes, sewage pipes, lightning rods, or telephone ground wires.
  Gas pipes : can explode or catch fire if there is a gas leak.
  Sewage pipes : no grounding effect is possible if hard plastic piping is used.
  Telephone ground wires and lightning rods : dangerous when struck by lightning due to abnormal rise in electrical potential in the grounding.
- Be sure to install an earth leakage circuit breaker.
  This unit uses an inverter, so install the earth leakage circuit breaker that be capable of handling high harmonics in order to prevent malfunctioning of the earth leakage circuit breaker itself.
- Earth leakage circuit breaker which are especially for protecting ground-faults should be used in conjunction with main switch or fuse for use with wiring.

Note

- Electrical wiring must be done in accordance with the wiring diagrams and the description herein.
- Do not operate until refrigerant piping work is completed.
  (If operated before complete the piping work, the compressor may be broken down.)
- Never remove thermistor, sensor or etc. when connecting power wiring and transmission wiring.
  (If operated with thermistor, sensor or etc. removed, the compressor may be broken down.)
- This product have reversed phase protection detector that only works when the power is turned on. If there exists black out or the power goes on and off which the product is operating, attach a reversed phase protection circuit locally. Running the product in reversed phase may break the compressor and other parts.
- Attach the power wire securely. Introducing power with a missing N-phase or with a mistaken N-phase will break the unit.
- Never connect the power supply in reversed phase.
  The unit can not operate normally in reversed phase.
  If you connect in reversed phase, replace two of the three phases.
- Make sure the electrical unbalance ratio is no greater than 2%. If it is larger than this, the unit's lifespan will be reduced.
  If the ratio exceeds 4%, the unit will shut down and an malfunction code will be displayed on the indoor remote controller.
- Connect the wire securely using designated wire and fix it with attached clamp without applying external pressure on the terminal parts (terminal for power wiring, terminal for transmission wiring and earth terminal).
- If there exists the possibility of reversed phase, lose phase, momentary blackout or the power goes on and off while the product is operating, attach a reversed phase protection circuit locally. Running the product in reversed phase may break the compressor and other parts.

7-1 Power circuit, safety device and cable requirements

- A power circuit (see the following table) must be provided for connection of the unit. This circuit must be protected with the required safety devices, i.e. a main switch, a slow blow fuse on each phase and an earth leakage circuit breaker.
- When using residual current operated circuit breakers, be sure to use a high-speed type (0.1 second or less) 200mA rated residual operating current.
- Use copper conductors only.
- Use insulated wire for the power cord.
- Select the power supply cable type and size in accordance with relevant local and national regulations.
- Specifications for local wiring are in compliance with IEC60245.
- Use wire type H05VV when protected pipes are used.
  Use wire type H07RN-F when protected pipes are not used.

	Phase and frequency	Voltage	Minimum circuit amp.	Recom-mended fuses
REYQ8PY1	ϕ 3, 50Hz	380-415V	17.1A	20A
REYQ10PY1	ϕ 3, 50Hz	380-415V	22.1A	25A
REYQ12PY1	ϕ 3, 50Hz	380-415V	22.3A	25A
REYQ14PY1	ϕ 3, 50Hz	380-415V	32.8A	40A
REYQ16PY1	ϕ 3, 50Hz	380-415V	33.0A	40A

7-2 Wiring Connection Example for Whole System

(Refer to figure 17)

1. Power supply
2. Main switch
3. Earth leakage circuit breaker
4. Fuse
5. Outdoor unit
6. COOL/HEAT selector
7. Remote controller
8. Indoor unit
9. BS unit

Note

- Make sure the weak electric wiring (i.e. for the remote controller, between units, etc.) and the power wiring do not pass near each other, keeping them at least 50 mm apart.
  Proximity may cause electrical interference, malfunctions, and breakage.
- Be sure to connect the power wiring to the power wiring terminal block and secure it as described in "**7-5 Power Wiring Connection Procedure**".
- Transmission wiring should be secured as described in "**7-4 Transmission Wiring Connection Procedure**".
- Secure wiring with clamp such as insulation lock ties to avoid contact with piping.
- Shape the wires to prevent the structure such as the EL. COMPO. BOX lid deforming. And close the cover firmly.
- All field wiring is to be procured on site.

7-3 Leading wire Procedure

- The power wiring and ground wiring are passed out from the power wiring hole on the sides, the front (knock hole) or the bottom frame (knock hole) .
- The transmission wiring is passed out from the wiring hole (knock hole) on the front of the unit or from a piping hole.

(Refer to figure 18)

1. Electrical wiring diagram
2. On the back of the EL .COMPO. BOX (1) lid.
3. Power wiring, ground wiring (inside conduit)
4. (When the wiring is routed out through the side panel.)
5. Transmission wiring
6. Pipe opening
7. Conduit
8. For power wiring and ground wiring
9. Through cover
10. Cut off the shaded zones before use.
11. Burr
12. Knockout hole
13. For transmission wiring
14. EL. COMPO. BOX (1)
15. EL. COMPO. BOX (2)

Note

- Open the knock holes with a hammer or the like.
- After knocking out the holes, we recommend you remove any burrs and paint them using the repair paint to prevent rusting. **(Refer to figure 18)**
- When passing wiring through the knock holes, remove burrs around the knock holes and protect the wiring with protective tape. **(Refer to figure 18)**
- If small animals might enter the unit, block off any gaps (hatching parts in figure 18) with material (field supply).

7-4 Transmission Wiring Connection Procedure

- Referring to figure 19 connect the transmission wiring between outdoor unit and indoor unit, outdoor unit and outdoor unit of other system.

(Refer to figure 19)
1. EL. COMPO. BOX (1)
2. EL. COMPO. BOX (2)
3. Never connect the power wire.
4. To outdoor unit of other system
5. Use duplex wires (No polarity)
6. BS unit
7. Indoor unit
8. Indoor unit (Cooling only)

Note
- Do not connect the power wiring to terminals for the transmission wiring. Doing so would destroy the entire system.
- When connecting wires to the terminal block on the PC-board, too much heat or tightening could damage the PC-board. Attach with care. See the table below for the tightening torque of the transmission wiring terminals.

Screw size	Tightening torque (N · m)
M3.5 (A1P)	0.80 - 0.96

- All transmission wiring should use sheathed vinyl cord 0.75-1.25 mm^2 or cable (duplex).
- Transmission wiring should be done within the following limitations. If they are exceeded, transmission problems may occur.
  Between outdoor unit and BS (or indoor) unit
  Between BS unit and indoor unit
  Between outdoor unit and outdoor unit of other systems
  Max. wiring length :1,000 m
  Max. total wiring length :2,000 m
  Max. no. of branches :16
  [Note]
  No branch is allowed after branch (**See figure 20**)
  Max. no. of outdoor units of other system that can be connected : 10

(Refer to figure 20)
1. Branch
2. Branch after branch

- The transmission wiring inside the EL.COMPO.BOX (1) (right) should be secured using the clamp (1) as shown in figure 21.

(Refer to figure 21)
1. In the EL.COMPO.BOX (1) (right)
2. Retain to the EL.COMPO.BOX with the accessory clamp (1).

- Outside the units, the transmission wiring must be finished simultaneously with the local refrigerant piping, and wound with tape (field supply) as shown in figure 22.

(Refer to figure 22)
1. Suction gas pipe
2. HP/LP gas pipe
3. Liquid pipe
4. Insulation material
5. Finishing tape
6. Transmission wiring

- Wiring to other systems should be connected to terminals F1 and F2 (TO OUT/D UNIT) on the PC-board of the unit. Connecting the wires to the Q1, Q2 (TO MULTI UNIT) terminals results in malfunction.
- The Q1, Q2 (TO MULTI UNIT) terminals of EL. COMPO. BOX (1) (right) are connected to the Q1, Q2 (TO MULTI UNIT) terminals of EL. COMPO. BOX (2) (left) by internal tansmission wiring. Do not remove the internal transmission wiring.

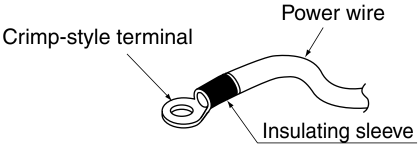
7-5 Power Wiring Connection Procedure

- Be sure to connect the power supply wiring to the power supply terminal block and hold it in place using the included clamp as shown in the figure 23.
- The L1, L2, L3 and N phases of the power wiring should be secured separately to the hook using the included clamp (1).
- The ground wiring should be bound to the power wiring using the included clamp (1) to prevent outside force from being applied to the terminal area.

(Refer to figure 23)
1. Power supply (3N~ 380-415V 50Hz)
2. Earth leakage circuit breaker
3. Branch switch, Overcurrent breaker
4. Ground wire
5. EL. COMPO. BOX (1)
6. EL. COMPO. BOX (2)
7. Do not open the EL. COMPO. BOX (2) lid. (There are no work when installation)
8. Attach insulation sleeves
9. Power supply terminal block
10. Ground terminal
11. Clamp (1) (accessory)

⚠ Caution

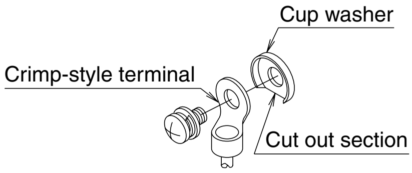
- Be sure to use crimp-style terminal with insulating sleeves for connections. (See the figure below.)



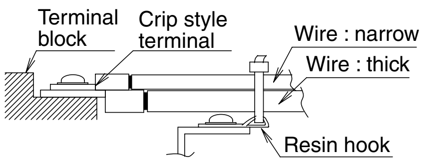
- For wiring, use the designated power wire and connect firmly, then secure to prevent outside pressure being exerted on the terminal board.
- Use an appropriate screwdriver for tightening the terminal screws. A screwdriver with a small head will strip the head and make proper tightening impossible.
- Over-tightening the terminal screws may break them. See the following table for the tightening torque of the terminal screws.

Screw size	Tightening torque (N·m)
M8 Power terminal, ground terminal	5.5 ~7.3

- When pulling the ground wire out, wire it so that it comes through the cut out section of the cup washer. (See the figure below.) An improper ground connection may prevent a good ground from being achieved.



- When two wires are connected to a single terminal, connect them so that the rear sides of the crimp contacts face each other. Also, make sure the thinner wire is on top, securing the two wires simultaneously to the resin hook using the included clamp (1).



7-6 Procedure for Wiring Inside Units

- Referring to figure 24, secure and wire the power and transmission wiring using the included clamp (1), (2), and (3).
- Wire so that the ground wiring does not come into contact with the compressor lead wiring.
  If they touch, this may have an adverse effect on other devices.
- The transmission wiring must be at least 50 mm away from the power wiring.
- Make sure all wiring do not contact to the pipes (hatching parts in the figure 24).

(Refer to figure 24)
1. Secure to the hook of column support using the accessory calmp (1).
2. Electric conduit
3. When routing out the power/ground wires from the left side.
4. When routing out the transmission wiring from the opening for piping.
5. When routing out the power/ground wires from the front.
6. Clear over 50 mm.

7. When routing out the transmission wiring from the knockout hole.
8. When routing out the power/ground wires from the right side.
9. Power wiring
10. Ground wire
11. Transmission wiring
12. When wiring, exercise sufficient caution not to detach the acoustic insulators from the compressor.
13. Secure to the back side of the support beam using the accessory clamp (1).
14. Retain to the back of the column support with the accessory clamp (2).

Note

- After wiring work is completed, check to make sure there are no loose connections among the electrical parts in the EL.COMPO.BOX (1) (right).

8. AIR TIGHT TEST AND VACUUM DRYING

- After finished piping work, carry out air tight test and vacuum drying.

Note

- Always use nitrogen gas for the airtightness test.
- Absolutely do not open the shutoff valve until the main power ciruit insulation measurement has been completed. (measuring after the shutoff valve is opened will cause the insulation value to drop.)

<Needed tools>

Gauge manifold Charge hose valve	• To prevent entry of any impurities and insure sufficient pressure resistance, always use the special tools dedicated for R410A. • Use charge hose that have pushing stick for connecting to service port of shutoff valves or refrigerant charge port.
Vacuum pump	• The vacuum pump for vacuum drying should be able to lower the pressure to –100.7kPa (5 Torr –755mm Hg). • Take care the pump oil never flow backward into the refrigerant pipe during the pump stops.

<The system for air tight test and vacuum drying>

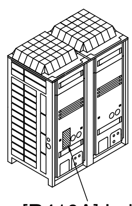
- Referring to figure 25, connect an nitrogen tank, refrigerant tank, and a vacuum pump to the outdoor unit.
  The refrigerant tank and the charge hose connection to refrigerant charge port or the valve A in figure 25 are needed in "**11. ADDITIONAL REFRIGERANT CHARGE AND CHECK OPERATION**".

(Refer to figure 25)

1. Gauge manifold
2. Nitrogen
3. Measuring device
4. R410A tank (with siphon)
5. Vacuum pump
6. Charge hose
7. Refrigerant charge port
8. HP/LP gas pipe shutoff valve
9. Suction gas pipe shutoff valve
10. Liquid pipe shutoff valve
11. Valve A
12. Valve B
13. Valve C
14. Outdoor unit
15. To BS (or indoor) unit
16. Shutoff valve
17. Service port
18. Field piping
19. Gas flow

Note

- The airtightness test and vacuum drying should be done using the service ports of HP/LP gas pipe, suction gas pipe and liquid pipe shutoff valve.
  See the [R410A] Label attached to the front plate of the outdoor unit for details on the location of the service port (see figure at right)
- See **[Shutoff valve operation procedure]** in "**11-1 Before working**" for details on handling the shutoff valve.



[R410A] Label

- The refrigerant charge port is connected to unit pipe.
  When shipped, the unit contains the refrigerant, so use caution when attaching the charge hose.

<Air tight test>

Pressurize the liquid pipe, suction gas pipe and HP/LP gas pipe from the service ports of each shutoff valve to 4.0MPa (40bar) (do not pressurize more than 4.0MPa (40bar)). If the pressure does not drop within 24 hours, the system passes the test.
If there is a pressure drop, check for leaks, make repairs and perform the airtight test again.

<Vacuum drying>

Evacuate the system from the liquid pipe, suction gas pipe and HP/LP gas pipe shutoff valve service ports by using a vacuum pump for more than 2 hours and bring the system to –100.7kPa or less. After keeping the system under that condition for more than 1 hour, check if the vacuum gauge rises or not. If it rises, the system may either contain moisture inside or have leaks.

Note

If moisture might enter the piping, follow belows.
(I.e., if doing work during the rainy season, if the actual work takes long enough that condensation may form on the inside of the pipes, if rain might enter the pipes during work, etc.)

(1) After performing the vacuum drying for two hours, pressurize to 0.05 MPa (i.e., vacuum breakdown) with nitrogen gas, then depressurize down to –100.7 kPa for an hour using the vacuum pump (vacuum drying).
(2) If the pressure does not reach –100.7 kPa even after depressurizing for at least two hours, repeat the vacuum breakdown - vacuum drying process.

After vacuum drying, maintain the vacuum for an hour and make sure the pressure does not rise by monitoring with a vacuum gauge.

9. PIPE INSULATION

- Insulation of pipes should be done after performing "**8. AIR TIGHT TEST AND VACUUM DRYING**".
- Always insulate the liquid piping, the HP/LP gas piping, the suction gas piping, the gas piping and these pipe connections.
  Failing to insulate the pipes may cause leaking or burns.
  Especially, be sure to insulate the HP/LP gas piping as withstanding as the suction pipe because the suction gas follows in the HP/LP gas piping when the system is whole cooling mode.
  And be sure to use the insulation which can withstand such temperatures of 120°C or more for the HP/LP gas piping and the gas piping because the high pressure gas follows in these pipings.
- Reinforce the insulation on the refrigerant piping according to the installation environment. Condensation might form on the surface of the insulation. Refer to the below.
  - Ambient temperature : 30°C, humidity : 75% to 80% RH : min. thickness : 15mm.
  - If the ambient temperature exceeds 30°C and the humidity 80% RH, then the min. thickness is 20mm.
    See the Engineering data book for detail.
- If there is a possibility that condensation on the shutoff valve might drip down into the indoor unit through gaps in the insulation and piping because the outdoor unit is located higher than the indoor unit, etc., this must be prevented by caulking the connections, etc. **(Refer to figure 26)**
- The piping lead-out hole lid should be attached after opening a knock hole. **(Refer to figure 27)**
- If small animals and the like might enter the unit through the piping lead-out hole, close the hole with blocking material (procured on site) after completion of "**11. ADDITIONAL REFRIGERANT CHARGE AND CHECK OPERATION**". **(Refer to figure 30)**

(Refer to figure 26)

1. Insulation material
2. Caulking, etc.

(Refer to figure 27)

1. Piping lead-out hole lid
2. Open a knock hole at "".
3. Block "".

Note

- After knocking out the holes, we recommend you remove burrs in the knock holes (**See figure 27**) and paint the edges and areas around the edges using the repair paint.

10. CHECKING OF DEVICE AND INSTALLATION CONDITIONS

Be sure to check the followings.

For those doing electrical work

1. Make sure there is no faulty transmission wiring or loosing of a nut.
   See “**7-4 Transmission Wiring Connection Procedure**”.
2. Make sure there is no faulty power wiring or loosing of a nut.
   See “**7-5 Power Wiring Connection Procedure**”.
3. Has the insulation of the main power circuit deteriorated?
   Measure the insulation and check the insulation is above regular value in accordance with relevant local and national regulations.

For those doing pipe work

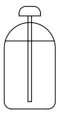
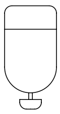
1. Make sure piping size is correct.
   See “**6-1 Selection of piping material and Refrigerant branching kit**”.
2. Make sure insulation work is done.
   See “**9. PIPE INSULATION**”.
3. Make sure there is no faulty refrigerant piping.
   See “**6. REFRIGERANT PIPING**”.

11. ADDITIONAL REFRIGERANT CHARGE AND CHECK OPERATION

The outdoor unit is charged with refrigerant when shipped from the factory, but depending on the size and length of the piping when installed, it may require additional charging.
For charging the additional refrigerant, follow the procedure in this chapter.
And then carry out the check operation.

11-1 Before working

[About the refrigerant tank]
Check whether the tank has a siphon pipe before charging and place the tank so that the refrigerant is charged in liquid form.
(See the figure below.)

With siphon pipe
 Stand the tank upright and charge. (The siphon pipe goes all the way inside, so the tank does not need be put upside-down charge in liquid form.)
Other tanks
 Stand the tank upside-down and charge.

Note

- Always use the proper refrigerant (R410A). If charged with the refrigerant containing an improper material, it may cause an explosion or accident.
- R410A is a mixed refrigerant, so charging it as a gas will cause the refrigerant composition to change, which may prevent normal operation.

[Shutoff valve operation procedure]
When operating the shutoff valve, follow the procedure instructed below.

Note

- Do not open the shutoff valve until “**10. CHECKING OF DEVICE AND INSTALLATION CONDITIONS**” are completed. If the shutoff valve is left open without turning on the power, it may cause refrigerant to buildup in the compressor, leading insulation degradation.
- Be sure to use the correct tools.
  The shutoff valve is not a back-seat type. If forced it to open, it might break the valve body.
- When using a service port, use the charge hose.
- After tightening the cap, make sure no refrigerant gas is leaking.

<u>Tightening torque</u>
The sizes of the shutoff valves on each model and the tightening torque for each size are listed in the table below.

<Size of Shutoff Valve>

	8HP type	10HP type	12HP type	14HP type	16HP type
Liquid pipe shutoff valve	ϕ9.5 The 12HP type corresponds to the 12.7-diameter onsite piping using the accessory pipe.			ϕ12.7	
Suction gas shutoff valve	ϕ25.4 The 8HP type corresponds to the 19.1-diameter onsite piping using the accessory pipe. The 10HP type corresponds to the 22.2-diameter onsite piping using the accessory pipe. The 12-16 HP type corresponds to the 28.6-diameter onsite piping using the accessory pipe.				
HP/LP gas shutoff valve	ϕ19.1 The 8HP type corresponds to the 15.9-diameter onsite piping using the accessory pipe. The 14 · 16 HP type corresponds to the 22.2-diameter onsite piping using the accessory pipe.				

(Refer to figure 28)

1. Service port
2. Cap
3. Hex holes
4. Shaft (valve body)
5. Seal section

<u>To open</u>

1. Remove the cap and turn the shaft counterclockwise with the hexagon wrench (JISB4648).
2. Turn it until the shaft stops.
3. Make sure to tighten the cap securely.
   (For the tightening torque, refer to the item <Tightening Torque>.)

<u>To close</u>

1. Remove the cap and turn the shaft clockwise with the hexagon wrench (JISB4648).
2. Securely tighten the valve until the shaft contacts the main body seal.
3. Make sure to tighten the cap securely.
   (For the tightening torque, refer to the item <Tightening Torque>.)

<Tightening torque>

Shutoff valve size	Tightening torque N·m (Turn clockwise to close)			
	Shaft (valve body)		Cap (valve lid)	Service port
ϕ 9.5	5.4 - 6.6	Hexagonal wrench 4 mm	13.5 - 16.5	11.5 - 13.9
ϕ 12.7	8.1 - 9.9		18.0 - 22.0	
ϕ 19.1	27.0 - 33.0	Hexagonal wrench 8 mm	22.5 - 27.5	
ϕ 25.4				

[How to Check How Many Units are Connected]
It is possible to find out how many indoor or outdoor unit in the system are turned on by operating the push button on the PC-board (A1P) of outdoor unit (In case of multi system master unit).
Follow the procedure below to check how many indoor or outdoor units are turned on.

(LED display: ● ...OFF ☼ ...ON ◐ ...Blinking * ...Uncertain)		LED display						
		H1P	H2P	H3P	H4P	H5P	H6P	H7P
(1) Press the MODE button (BS1) once at **Setting Mode 1** (H1P : off), and set the MONITOR MODE (H1P : Blinking).		◐	●	●	●	●	●	●
(2) Press the SET button (BS2) the number of times until the LED display matches that at right.	For checking the number of outdoor units : eight times	◐	●	●	☼	●	●	●
	For checking the number of indoor units : five times	◐	●	●	●	☼	●	☼
(3) Press the RETURN button (BS3) and read the number of units from the display of H2P through H7P. [Reading Method] The display of H2P through H7P should be read as a binary number, with ◐ standing for “1” and ● standing for “0”.		◐	*	*	*	*	*	*
Ex: For the LED display at right, this would be “0 1 0 1 1 0 ”, which would mean 22 units are connected. 32 × **0** + 16 × **1** + 8 × **0** + 4 × **1** + 2 × **1** + 1 × **0** = 22 units Note: “000000” indicates 64 units.		◐	●	◐	●	◐	◐	●
(4) Press the MODE button (BS1) once. This returns to **Setting Mode 1** (H1P : OFF, default).		●	●	☼	●	●	●	●

Note
Press the “MODE button” (BS1) if you get confused while operating.
This returns to **Setting Mode 1** (H1P : OFF, default).

11-2 Procedure of Adding Refrigerant charging and check operation

Warning **Electric Shock Warning**

- Make sure to close the EL. COMPO. BOX (1) (right) lid before turning on the power.
- Do not open the EL. COMPO. BOX (2) lid or that inspection door.
- Perform the setting on the PC-board (A1P) of the outdoor unit and check the LED display after the power is on via the inspection door which is in the EL. COMPO. BOX (1) (right) lid.

  (Refer to figure 29)
  1. EL. COMPO. BOX (1) (right)
  2. Inspection door
  3. EL. COMPO. BOX (2) (left)
  4. Do not open the EL. COMPO. BOX (2) (left) lid or that inspection door.
  5. EL. COMPO. BOX (1) (right) lid
  6. LED (H1~8P)
  7. Push button (BS1~5)
  8. Lift the protruding part to open the inspection door.
- Use an insulated rod to operate the push buttons via the EL. COMPO. BOX’s inspection door.
  There is a risk of electric shock if you touch any live parts, since this operation must be performed with the power on.

Caution

- Make sure to use the protect tool (protective groves and goggles) when charging the refrigerant.
- Due to a danger of liquid hammer, the refrigerant must not be charged over the allowable maximum amount when charging the refrigerant.
- Do not perform the refrigerant charging operation under working for the BS and indoor unit.
- When opening the front panel, make sure to take caution to the fan rotation during the working.
  After the outdoor unit stops operating, the fan may keep rotation for a while.

Note
- If operation is performed within 12 minutes after the BS, indoor and outdoor units are turned on, H2P will be lit on and the compressor will not operate.
  Check the LED display indicate as shown below.

H1P	H2P	H3P	H4P	H5P	H6P	H7P
●	●	☼	●	●	●	●

- In order to ensure uniform refrigerant distribution, it may take up to around 10 minutes for the compressor to start up after the unit starting operating. This is not a malfunction.
- The refrigerant charge port is connected to the piping inside the unit. When the unit is shipped from the factory, the unit’s internal piping is already charged with refrigerant, so be careful when connecting the charge hose.
- After adding the refrigerant, make sure to close the lid of the refrigerant charging port.
  The tightening torque for the lid is 11.5 to 13.9 Nm.
- See [Shutoff valve operation procedure] in chapter 11-1 for details on how to handle shutoff valves.
- When done or when pausing the refrigerant charging operation, close the valve of the refrigerant tank immediately.
  The refrigerant charge port of this product have electric expansion valve. The valve will be closed at end of refrigerant charging. However the valve will be opened on operation after refrigerant charging (check operation, nomal operation, etc.).
  If the tank is left with the valve open, the amount of refrigerant which is properly charged may be off the point.
- Make sure to perform the check operation after installation. Otherwise, the malfunction code “U3” will be displayed and normal operation cannot be performed.
  And the failure of “Check of miswiring” may also cause abnormal operation. Performance may drop due to the failure of “Judgment of piping length”.
- Check operation must be performed for each refrigerant piping system. Checking is impossible if plural systems are being done at once.
- The individual problems of indoor units can not be checked. About these problems check by test run after the check operation is completed. (See chapter 13)
- The check operation cannot be performed in recovery or other service modes.

11-2-1 Procedure of Adding Refrigerant charging

1. Make sure the following works are complete in accordance with the installation manual.
- Piping work
- Wiring work
- Air tight test
- Vacuum drying
- Installation work for BS, indoor unit

2. Calculate the "additional charging amount" using "How to calculate the additional refrigerant to be charged" in "**6-5 Example of connection**".

3. Open the valve B (**See the figure 30**. The valve A,C and the liquid pipe, suction gas pipe, HP/LP gas pipe shutoff valves must be left closed), and charge the refrigerant of the "additional charging amount" from the liquid side shutout valve service port.

(Refer to figure 30)
1. Measuring device
2. R410A tank (with siphon)
3. Charge hose
4. Refrigerant charge port
5. HP/LP gas pipe shutoff valve
6. Suction gas shutoff valve
7. Liquid pipe shutoff valve
8. Valve A
9. Valve B
10. Valve C
11. Outdoor unit
12. To BS, indoor unit
13. Field pipings
14. Refrigerant flow
15. Shutoff valve
16. Service port

4. If the "additional charging amount" was charged fully, close the valve B and go to step 6.
If the "additional charging amount" was not charged fully, close the valve B and go to step 5.

5. Perform the refrigerant charging following [Automatic refrigerant charging operation procedure] as shown below. And charge the remaining refrigerant of the "additional charging amount".

Note
- For performing the automatic refrigerant charging operation, the push button on the PC-bord (A1) of outdoor unit are used. (See figure 29.)
  And the refrigerant are charged from the refrigerant charge port via the valve A. (See figure 31.) For operating the push button and opening or closeing the valves, follow the procedure.

- During Automatic refrigerant charging operation, the system will select charging mode (cooling mode or heating mode) by the temperature condition as follows.

  Outdoor temp. : 0˚C DB ~ 43˚C DB
  Indoor temp. : 10˚C DB ~ 32˚C DB → Cooling mode
  Less than above range → Heating mode

  When cahrging in cooling mode, the system will stop operation when the required amount of refrigerant is charged.
  During charging in heating mode, a person must manually close valve A and stop operation.
  Beforehand, check the remaining refrigerant that is needed to charge based on the "additional charging amount" in step 2 and the charged amount in step 3.
- The refrigerant will be charged about 30kg in one hour at outdoor temp. 30°C DB (about 12kg at outdoor temp. 0°C DB).
- During Automatic refrigerant charging operation, you can stop the operation forcedly by pushing MODE button (BS1).

(Refer to figure 31)
1. Meauring device
2. R410A tank (with siphon)
3. Charge hose
4. Refrigerant charge port
5. HP/LP gas pipe shutoff valve
6. Suction gas pipe shutoff valve
7. Liquid pipe shutoff valve
8. Valve A
9. Valve B
10. Valve C
11. Outdoor unit
12. To BS, indoor unit
13. Field pipings
14. Refrigerant flow when charging
15. Shutoff valve
16. Service port

[Automatic refirgerant charging operation procedure]

Note
The marks of LED mean as follows.
● : OFF ☼ : ON ◑ : Blinking ∗ : OFF, ON or Brinking

(1) Open the liquid pipe, suction gas pipe and HP/LP gas pipe shutoff valves. (The valve A~C must be closed. See figure 31.)

(2) • Close the EL. COMPO. BOX (1) lid and all front panel except on the EL. COMPO. BOX (1) side. (*1) And turn the power to the outdoor unit and all connected BS, indoor units. (*2)
• After H2P stop blinking (about 12 minutes after turning on the power), check H2P is OFF.
If H2P is ON, check the malfunction code in the remote controller of indoor unit and correct the malfunction in accordance with [Remote controller display malfunction code] in chapter 11-2-2.

(3) Check the LED. And push the MODE button (BS1) once if the LED displays is not as below.

H1P	H2P	H3P	H4P	H5P	H6P	H7P
●	●	☼	●	●	●	●

(4) Push the TEST button (BS4) once. (The LED displays will change as below.)

H1P	H2P	H3P	H4P	H5P	H6P	H7P
☼	☼	☼	☼	☼	☼	☼

(5) Hold the TEST button (BS4) down for 5 seconds or more.
(The LED displays will change as below and fan of outdoor unit will start rotation.)

H1P	H2P	H3P	H4P	H5P	H6P	H7P
●	◑	●	●	●	∗	∗

(6) When the compressor start working and the LED displays change any state in below (*3), go to "In case of cooling mode" or "In case of heating mode" in accordance with the LED displays.

H1P	H2P	H3P	H4P	H5P	H6P	H7P	
◑	◑	◑	●	☼	●	☼	→ Go to "In case of cooling mode"
◑	◑	●	●	☼	●	☼	→ Go to "In case of heating mode"

In case of cooling mode

(7) Push the TEST button (BS4) once within 5 minutes after procedure (5) (*4) and close the all front panels (*5).
After that, open the valve A immediately (See figure 31) (*6) and watch the remote controller display of indoor unit.

(8) If the remote controller display shows "PE" code (*7), ready to close the valve A.
And go to procedure (9).
If the remote controller display shows other code, close the valve A immediately and refer to [Remote controller cooling mode malfunction code]

Beware the fan running when open the front panel.
The fan may continue rotation after the system stop the operation.

(9) When the compressor stop working (the fan may continue rotation.), close the valve A immediately (*8).
And check the LED displays are as below and the remote controller display shows "P9" code.

H1P	H2P	H3P	H4P	H5P	H6P	H7P
☼	◑	◑	☼	☼	☼	☼

After checking, push the MODE button (BS1) once and the charging is complete.

In case of heating mode

(7) Push the TEST button (BS4) once within 5 minutes after procedure (5) (*4) and close the all front panels.
After that, open the valve A immediately (See figure 31) (*6) and check the charged amount by meauring device.
During operation, if the remote controller display shows "P2" or "P8" code, close the valve A immediately and refer to [Remote controller heating mode malfunction code].

Beware the fan running when open the front panel.
The fan may continue rotation after the system stop the operation.

(8) When the required amount of refrigerant is charged, close the valve A (See figure 31) (*8) and push the RETURN button (BS3) once. And then go to procedure (9).

(9) Push the MODE button (BS1) once, and the charging is complete.

Notes (*1)~(*9)

(*1) Lead the refrigerant charge hose etc from the pipe intake. All front panels must be closed at the procedure (7).

(*2) • If you perform the refrigerant charging operation within the refrigerant system that have the power off unit, the operation cannot finish properly.
Check the number of outdoor and indoor units that is powered. For checking, see [How to check how many units are connected] in chapter 11-1.
• To energize the crankcase heater, make sure to turn on for 6 hours before starting operation.

(*3) It takes about 2~10 minutes for getting stability of refrigerant state. If the additional refrigerant is little and operation is started before getting stability, the system can not judge the charging amount precisely and it cause over charge.

(*4) If the TEST button (BS4) is not pushed within 5 minutes, “P2” code will displayed in the remote controller. In this case, refer [Remote controller cooling (or heating) mode malfunction code].

(*5) If the front panel is opened during the operation, the system cannot operate properly.

(*6) If you leave the system without connecting the refrigerant tank or opening the valve A for 30 minutes or more, the system stop operation and “P2” code are displayed in remote controller.
In this case, refer [Remote controller cooling (or heating) mode malfunction code].

(*7) Depending on the situation of operation such as the charging amount is little, the “PE” code may not be displayed and the “P9” code may be displayed.

(*8) Always close the valve A and take the tank off.
The refrigerant charge port of this unit have electric expansion valve and the valve are closed when charging is finished. However, the valve will opened when ather operation (Check operation, nomal operation, etc.). If you leave the tank connected, the refrigerant will charged and it cause over charge.

[Remote controller cooling mode malfunction code]

<table>
<tr><th>Code</th><th colspan="2">The work contents</th></tr>
<tr><td>PE</td><td colspan="2">Charging is almost finished. Ready to close the valve A.</td></tr>
<tr><td>PA
PH</td><td colspan="2">The refrigerant tank is empty. Close the valve A and replace empty tank to the new tank. After changing the tank, open the valve A again.
Beware the fan running. The outdoor unit does not stop operation.</td></tr>
<tr><td>P8</td><td colspan="2">Close the valve A immediately, and restart the operation from procedure (3).</td></tr>
<tr><td>P2</td><td>Operation is interrupted. Close the valve A immedeately and check the below items.
• Check if HP/LP gas pipe, suction gas pipe or liquid pipe shutoff valve is opened.
• Check the refrigerant tank is connected and the valve A was opend.
• Check if the air inlet and outlet of the indoor unit are not closed by an obstruction.</td><td rowspan="2">After correcting the abnormality, restart the operation from procedure (3).</td></tr>
<tr><td>*</td><td>Operation is stoped abnormally. Close the valve A immediately. Confirm the malfunction code and correct the abnormality following the [Remote controller displays malfunction code] in chapter 11-2-2.</td></tr>
<tr><td>P9</td><td colspan="2">Charging is finished. Close the valve A and take the refrigerant tank off.</td></tr>
</table>

[Remote controller heating mode malfunction code]

Code	The work contents
P8	Close the valve A immediately and push the TEST button (BS4) once. And restart from procedure (7) of “In case of heating mode”.
P2	Operation is interrupted. Close the valve A immedeately and check the below items. • Check if HP/LP gas pipe, suction gas pipe or liquid pipe shutoff valve is opened. • Check the refrigerant tank is connected and the valve A was opend. • Check if the air inlet and outlet of the indoor unit are not closed by an obstruction.

6. After completing the additional refrigerant charging, record the charging amount on the accessory “REQUEST FOR THE INDICATON” label (Installation records) and adhere it to the back side of the front panel. Also, record the factory charged refrigerant amount, additional refrigerant amount in the field and total refrigerant amount of the system to “ADDITIONAL REF. CHARGE” label and adhere in the proximity of the refrigerant charge port. About “ADDITIONAL REF. CHARGE” label, refer to [Important information regarding the refrigerant used] in “**1-2 Special notice of product**”.

11-2-2 Procedure of check operation

- Check operation perform the following work. Do the check operation following below.
Otherwise, malfunction code “U3” will be displayed in the remote controller and nomal operation can not be carried out.
  - Check of shutoff valve opening
  - Check of miswiring
  - Judgment of piping length
  - Check of refrigerant overcharge

Note

- Check operation can not carried out at outdoor temp. less than –5°C. Perform the check operation at day or time that outdoor temp. is –5°C or more.

[Check Operation Procedure]

(1) Close the EL. COMPO. BOX (1) lid and all front panels except as the side of the EL. COMPO. BOX (1) and turn on the power to the outdoor unit and all connected BS, indoor units. (Be sure to turn the power on at least 6 hours before operation in order to have power running to the crank case heater.)

(2) Make the onsite settings as needed using the push button (BS1-BS5) on the outdoor unit PC-board (A1P) with the power on. (See “**12. ONSITE SETTINGS**”)

(3) Perform the check operation following the Check Operation Method of the [Service Precautions] label (lower) on the EL. COMPO. BOX (1) lid (see figure 32). The system operation for about 40~60 minutes and automatically stops the check operation.
If the malfunction code is not displayed in the remote controller after the system stop, check operation is completed. Normal operation will be possible after 5 minutes. If the malfunction code is displayed in the remote controller, correct the malfunction following [Remote controller displays malfunction code] and perform the check operation again.

(Refer to figure 32)

1. EL. COMPO.BOX (1) lid
2. EL. COMPO.BOX (2) lid
3. [Service Precaution] label (upper)
4. [Service Precaution] label (lower)

Note

For interrupting the check operation, push RETURN button (BS3).

[Remote controller displays malfunction code]

Malfunction code	Installation error	Remedial action
E3, E4 F3, F6 UF	The shutoff valve of the outdoor unit is left closed.	Open the shutoff valve.
U1	The phases of the power to the outdoor unit is reversed.	Exchange two of the three phases (L1, L2, L3) to make a proper connection.
U1 U4 LC	No power is supplied to an outdoor, BS or indoor unit (including phase interruption).	Make sure the power source wire is properly connected to the outdoor, BS or indoor unit and revise if necessary.
UF	There is conflict on the connection of transmission wiring in the system.	Check if the refrigerant piping line and the transmission wiring are consistent with each other.
E3 F6 UF	Refrigerant overcharge.	Recalculate the additional amount refrigerant from the piping length and correct the refrigerant charge level by recovering any excessive refrigerant with a refrigerant recovery machine.
E4 F3	Insufficient refrigerant.	• Check if the additional refrigerant charge has been finished correctly. • Recalculate the additional amount refrigerant from the piping length and add the adequate amount.
U7, U4 UF, UH	Field wiring is connected to "TO MULTI UNIT (Q1,Q2)" terminal on the outdoor unit PC-board (A1P) when the system is one outdoor system.	Remove the line from the "TO MULTI UNIT (Q1, Q2)" terminal.
UA	The internal transmission wiring to "TO MULTI UNIT (Q1,Q2)" for the single outdoor unit system are disconnected.	Connect the internal transmission wiring to "TO MULTI UNIT (Q1,Q2)". (See the wiring diagram.)

Note

If any malfunction codes other than the above are displayed, check the service manual for how to respond.

12. ONSITE SETTINGS

Use the push button switches (BS1 through BS5) on the outdoor unit PC-board (A1P) to make the necessary onsite settings.
See the "Service Precautions" label (upper) on the EL. CONPO. BOX (1) lid for details on the positions and operating method of the push button switches and on the onsite setting. (see figure 32)
Make sure to record the setting on the accessory "REQUEST FOR THE INDICATION" label.

Warning **Electric Shock Warning**

Use an insulated rod to operate the push buttons via the inspection door of EL. COMPO. BOX (1) lid.
There is a risk of electric shock if you touch any live parts, since this operation must be performed with the power on.

13. TEST RUN

13-1 Before test run

- Make sure the following works are completed in accordance with the installation manual.
  - Piping work
  - Wiring work
  - Air tight test
  - Vacuum drying
  - Additional refrigerant charge
  - Check operation
- Check that all work for the BS, indoor unit are finished and there are no danger to operate.

13-2 Test Run

After all works are completed, operate the unit normally and check the following.
(1) Make sure the indoor and outdoor units are operating normally.
(2) Operate each indoor unit one by one and make sure the corresponding outdoor unit is also operating.
(3) Check to see if cold (or hot) air is coming out from the indoor unit.
(4) Push the fan direction and strength buttons on the remote controller to see if they operate properly.

Note

- Heating is not possible if the outdoor temperature is 24°C or higher. Refer to the Operation manual.
- If a knocking sound can be heard in the liquid compression of the compressor, stop the unit immediately and then energize the crank case heater for a sufficient length of time before restarting the operation.
- Once stopping, the compressor will not restart in about 5 minutes even if the On/Off button of the remote controller is pushed.
- When the system operation is stopped by the remote controller, the outdoor units may continue operating for further 5 minutes at maximum.
- The outdoor unit fan may rotate at low speeds if the Night-time low noise setting or the External low noise level setting is made, but this is not a malfunction.
- If the check operation was not performed at first istallation, the malfunction code "U3" will be displayed in the remote controller. Perform the check operation following "**11-2-2 Procedure of Check Operation**".

13-3 Checks After Test Run

Perform the following checks after the test run is complete.

- Record the contents of field setting.
  → Record them on the accessory "REQUEST FOR THE INDICATION" label.
  And attach the label on the back side of the front panel.
- Record the installation date.
  → Record the installation date on the accessory "REQUEST FOR THE INDICATION" label in accordance with the IEC60335-2-40.
  And attach the label on the back side of the front panel.

Note

After the test run, when handing the unit over to the customer, make sure the EL.COMPO.BOX lid, the inspection door, and the unit casing are all attached.

14. CAUTION FOR REFRIGERANT LEAKS

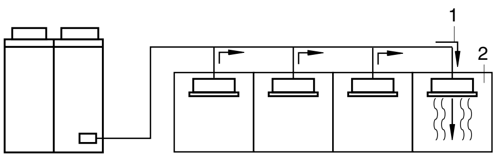
(Points to note in connection with refrigerant leaks)

Introduction

The installer and system specialist shall secure safety against leakage according to local regulations or standards. The following standards may be applicable if local regulations are not available.
The VRV System, like other air conditioning systems, uses R410A as refrigerant. R410A itself is an entirely safe non-toxic, non-combustible refrigerant. Nevertheless care must be taken to ensure that air conditioning facilities are installed in a room which is sufficiently large. This assures that the maximum concentration level of refrigerant gas is not exceeded, in the unlikely event of major leak in the system and this in accordance to the local applicable regulations and standards.

Maximum concentration level

The maximum charge of refrigerant and the calculation of the maximum concentration of refrigerant is directly related to the humanly occupied space in to which it could leak.
The unit of measurement of the concentration is kg/m^3 (the weight in kg of the refrigerant gas in 1m^3 volume of the occupied space).
Compliance to the local applicable regulations and standards for the maximum allowable concentration level is required.
In Australia the maximum allowed concentration level of refrigerant to a humanly space is limited to 0.35kg/m^3 for R407C and 0.44kg/m^3 for R410A.



1. direction of the refrigerant flow
2. room where refrigerant leak has occurred (outflow of all the refrigerant from the system)

Pay a special attention to the place, such as a basement, etc. where refrigerant can stay, since refrigerant is heavier than air.

Procedure for checking maximum concentration

Check the maximum concentration level in accordance with steps 1 to 4 below and take whatever action is necessary to comply.

1. Calculate the amount of refrigerant (kg) charged to each system separately.

amount of refrigerant in a single unit system (amount of refrigerant with which the system is charged before leaving the factory)	+	additional charging amount (amount of refrigerant added locally in accordance with the length or diameter of the refrigerant piping)	=	total amount of refrigerant (kg) in the system

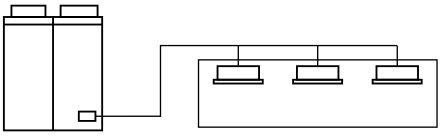
Note

- Where a single refrigerant facility is divided into 2 entirely independent refrigerant systems then use the amount of refrigerant with which each separate system is charged.

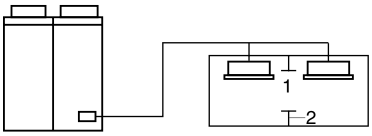
2. Calculate the smallest room volume (m^3)

Incase like the following, calculate the volume of (A), (B) as a single room or as the smallest room.

A. Where there are no smaller room divisions



B. Where there is a room division but there is an opening between the rooms sufficiently large to permit a free flow of air back and forth.



1. opening between rooms
2. partition

(Where there is an opening without a door or where there are openings above and below the door which are each equivalent in size to 0.15% or more of the floor area.)

3. Calculating the refrigerant density using the results of the calculations in steps 1 and 2 above.

$$\frac{\text{total volume of refrigerant in the refrigerant system}}{\text{size (m}^3\text{) of smallest room in which there is an indoor unit installed}} \leq \text{maximum concentration level (kg/m}^3\text{)}$$

If the result of the above calculation exceeds the maximum concentration level then make similar calculations for the second then third smallest room and so until the result falls short of the maximum concentration.

4. Dealing with the situations where the result exceeds the maximum concentration level.

Where the installation of a facility results in a concentration in excess of the maximum concentration level then it will be necessary to revise the system. Please consult your Daikin supplier.

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